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THE MINIMOOG AT 40

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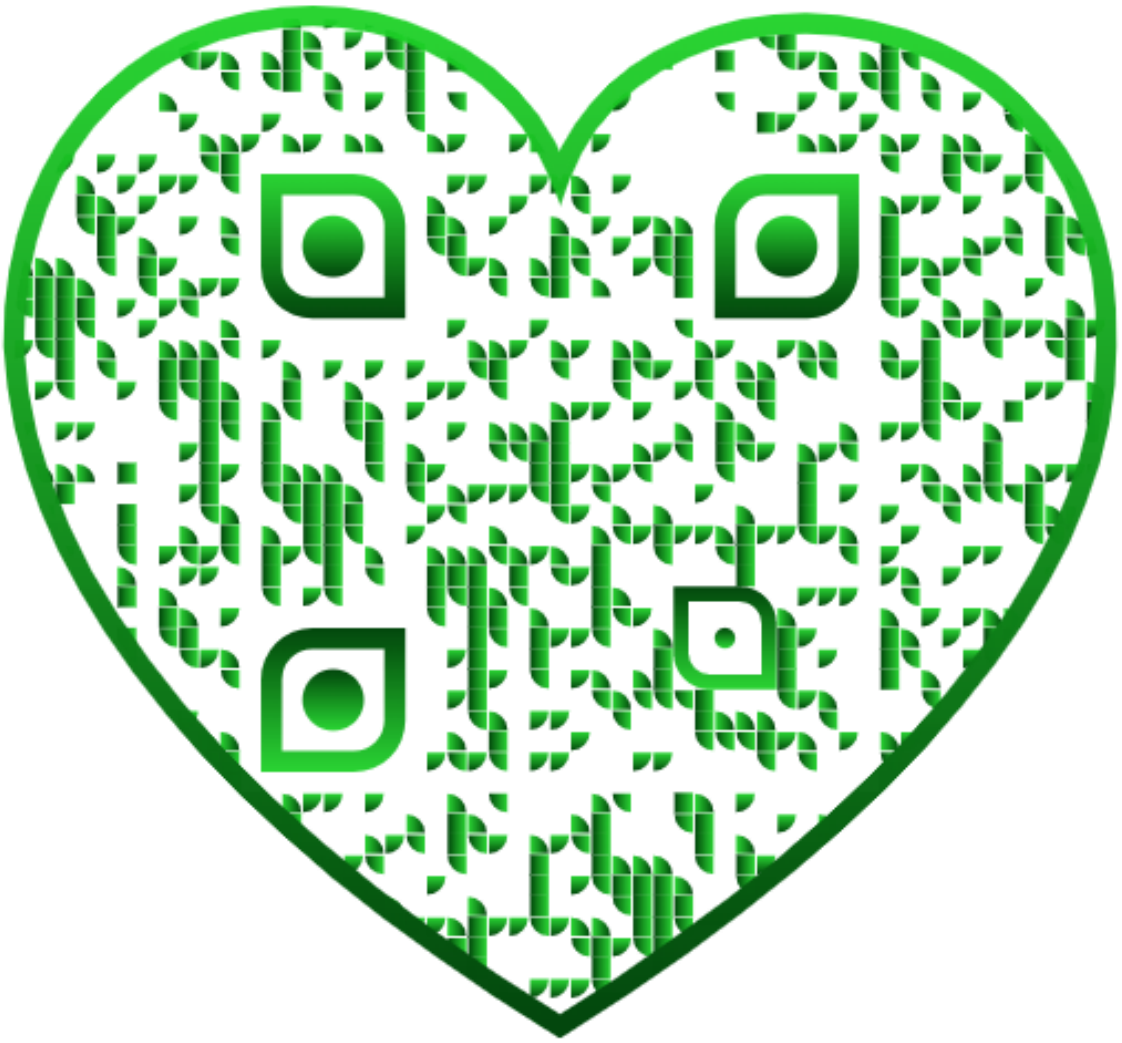
OCTOBER 2010



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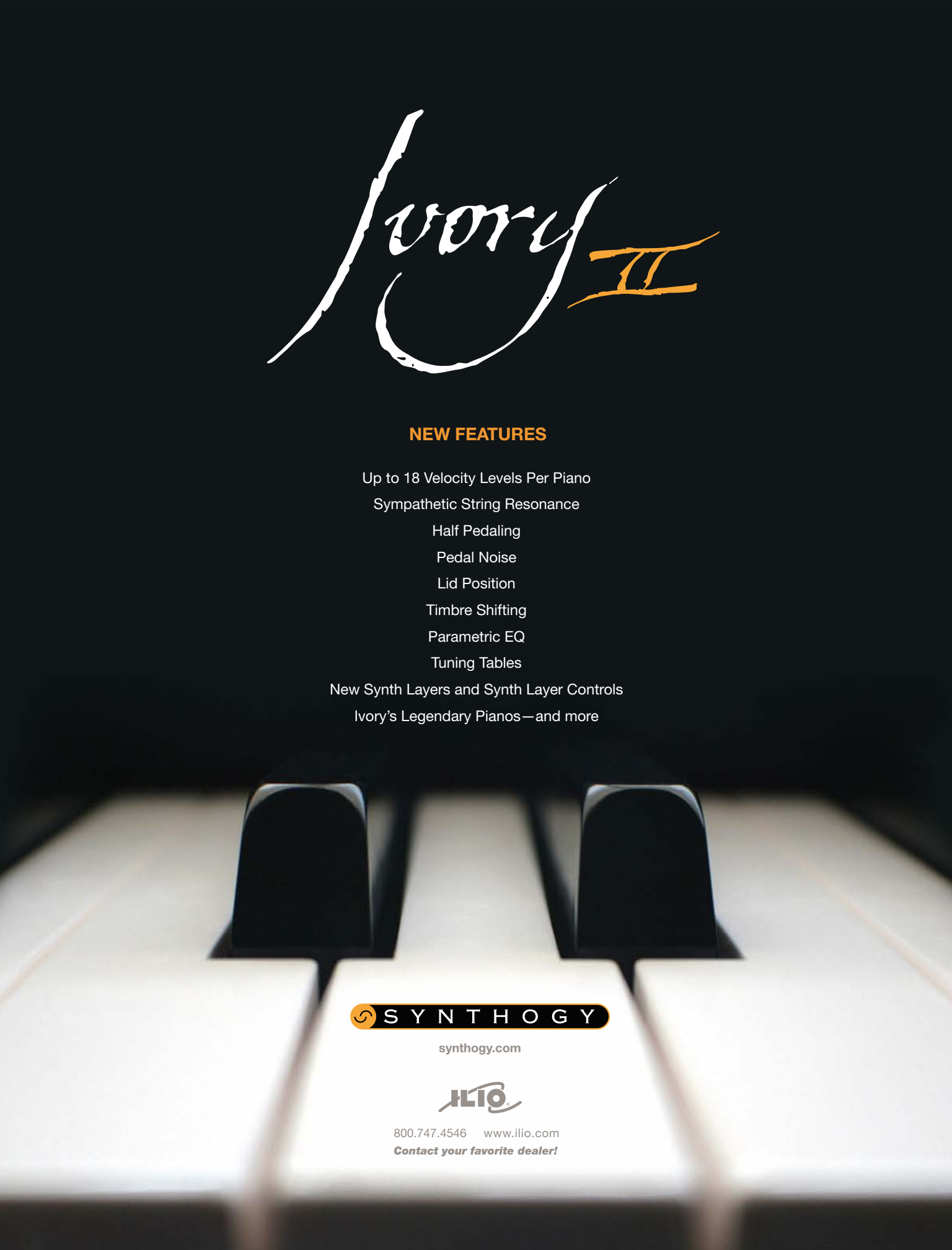
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From the Editor

I'm lucky to have a musical family, my mom being a classical pianist, and her mother and father, respectively, being a prohibition-era flapper who could throw a mean Scott Joplin stride and a high-note trumpeter who played big band swing the *first* time it was popular. I didn't appreciate it as much as I should have when I was a kid, but my family knew that the way to keep me at the keyboard was to plunk my *Star Trek*-watching little-boy brain in front of an instrument with buttons and blinking lights on it. That's why we got our first home organ, and why I first encountered the Minimoog.

When I was seven, we paid one of our regular visits to the Discovery Museum, a hands-on children's museum in Vermont. I don't remember the theme of the exhibit, but I do remember this odd little keyboard that hadn't been there last time. It had a wooden case, lots of knobs on a panel that flipped up on a hinge, and it made unearthly sounds that were nothing like the Hammond T-series spinet in our living room. They had to tear me away from the thing to give the next kid in line his turn. "Great," intoned my grandfather. "Something else he won't shut up until we buy."

In fact, I wouldn't get my first actual synth until age 15, but my grandfather was right. In the eight years between, I never shut up about synthesizers, and given my job description, it looks like I never will. So here's to Bob Moog, for starting my journey into electronic music, as he did for so many others.

Stephen Fortner

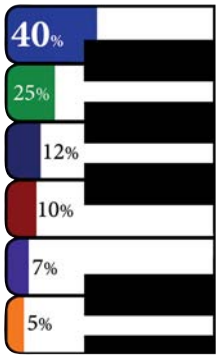
SOAPBOX

On the last page of the September issue, you show the keytars of the past, but you missed one. Back in 1972 or '73, Edgar Winter wanted a keyboard he could carry like a guitar, so he found a lightweight one at a music store. It was from one of the original ARP 2600s. The keyboard was separate from the controls, and he had it further separated with long cables running to the main synth. There are a few videos on YouTube showing this, and Edgar describes what he did. So when you show Roger Powell playing his in 1977, I believe you're wrong—Edgar's was first. Edgar even states in an interview that he was the first to use a keyboard like guitar. Oops! Jyme Bale

Because our "Time Machine" feature has limited space, we went with narrow criteria for "keytar": an obvious guitar-like design and a neck you grab with your left hand. This means we omitted some worthy contenders, including the Prophet Remote and Korg Poly-800. Also, Roger Powell's Probe was, to our knowledge, the first custom-built keytar controller, as opposed to a modification of something that already existed. Incidentally, Roger tells us it controlled a bank of Oberheim SEMs using a custom-written, pre-MIDI serial protocol. However, you're right to point out that Edgar Winter predated Powell for wearing a keyboard like a guitar. In the pic above, he's still at it with an Edirol MIDI controller. Stephen Fortner

The Poll

You run your keys in stereo. The house P.A. is mono. What do you do?


Monitor with my stereo gear; feed the house mono
40%
Run in mono with a smile on my face
25%
Question the sound engineer's competence
12%
Who cares? How many drink tickets do I get?
10%
Run in mono begrudgingly
7%
Crank my stereo monitor rig to fill the house
5%

Be counted!
New polls go live the first and third Tuesdays of each month at keyboardmag.com.

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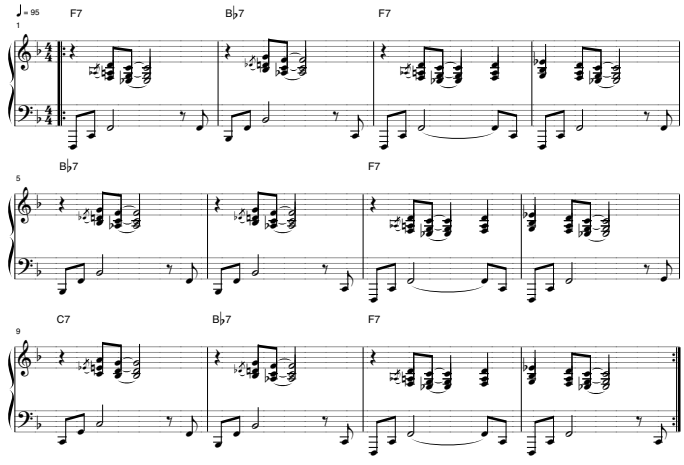
In Andy LaVerne's otherwise excellent blues lesson beginning on page 32 of the August issue, the sheet music for Examples 1 and 2 appears to be identical. Which one is correct, and can you provide the right sheet music for the other? —Tom Ruggles

That was indeed a clam. The music for Ex. 2 is repeated—once in Ex. 1, and again in Ex. 2, where it's supposed to be. Here's the correct music, which you can enjoy larger and with audio examples, on our website. Here's a shortcut link: keyboardmag.com/article/117243. Stephen Fortner

DIG MY RIG!

I'm in two bands and also take hired-gun gigs. I'm lucky to have accumulated over 90 keyboards and rack modules from which to build rigs for a specific purpose—good job, *Keyboard* advertisers!

For my ELP-style band MTR, I use a Yamaha Motif ES7 and a Korg CX-3, which has the "organ power-down" sound I can trigger with a pedal. I use a Roland JD-800 and a Minimoog Voyager Anniversary Edition, and I work the knobs on both for the whole show. An M-Audio Oxygen 8 is MIDI'ed to the Voyager, extending its key range to hit the low notes in "Tarkus." For getting out front, the Casio AZ-1 is my favorite keytar due to its aftertouch and left-hand controls layout. I bring out a vintage Minimoog and Multimoog for choice gigs.

Then there's Last Licks, a classic rock group in which I use a Hammond XK-2 because it really nails the Jon Lord sound, and I can almost get a Vox Continental out of it for Doors-style playing. In this band, I need quick sound changes more than realtime control, so a 73-key Korg M3 with the Radias expansion really delivers with its splits and layers. Then, it's a Roland VK-1000 MIDI'ed to a Yamaha Motif Rack, and a Korg MS2000 for its button layout and easy sound manipulation. Bruce MacPherson

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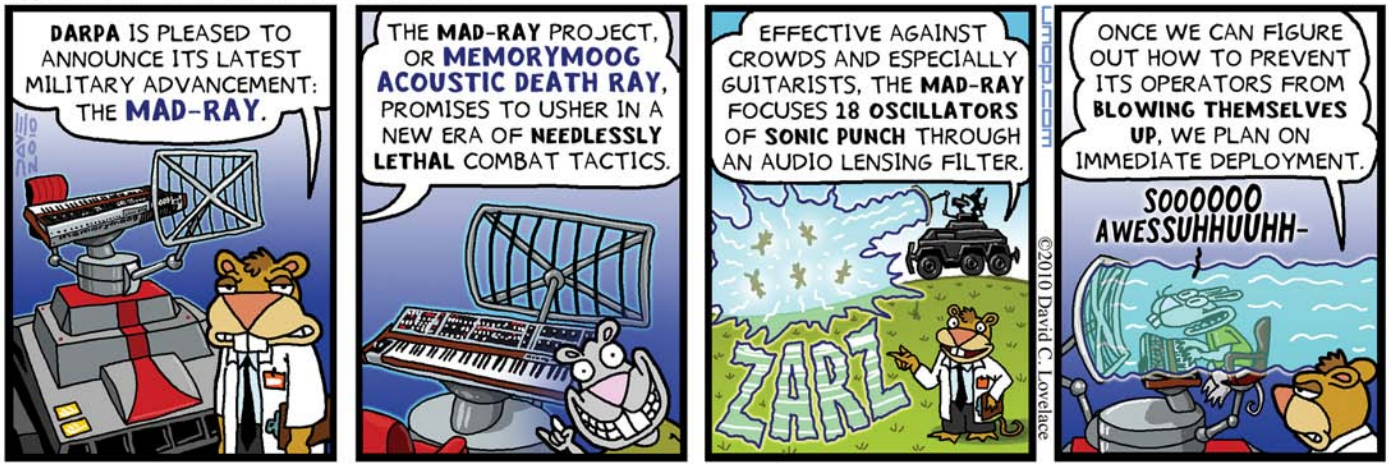
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KRISTEN LAWRENCE

Halloween Deserves Carols Too!

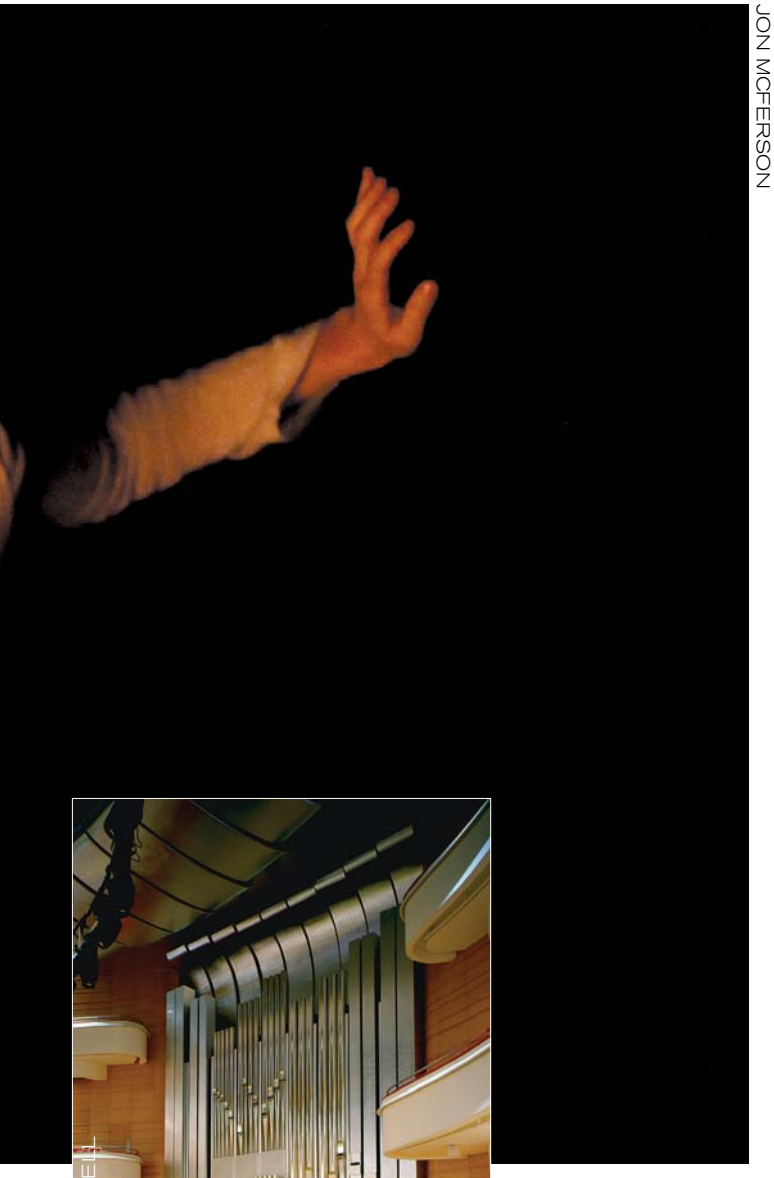
If the Halloween Town of Tim Burton's *The Nightmare Before Christmas* had a resident keyboardist, it would be Kristen Lawrence. "I've always loved autumn," she says. "Something about the angle of the sun, the chill in the air, and the energy I felt as Halloween neared—it was magical to me as a child, and it still is." She also cites a childhood spent in Orange County, California: "Basically, I grew up at Disneyland, and my favorite ride was the Haunted Mansion. I still remember the music from it."

Trained from age 12 in classical organ, and possessing a tremulous soprano that evokes a less breathy Kate Bush, Lawrence has appropriated the Christmas spirit on Halloween's behalf with an elegance Jack Skellington never quite managed: The songs on her EP *Arachnitect* and album *A Broom With a View* are unmistakably *carols*—in both their structure and their sense of joy—but they celebrate ghosts, bats, black cats, spiders, and vampires.

"There's so much wonderful music for Christmas," she reflects, "but what does Halloween get? Bach's 'Toccata in *D* Minor' and 'The Monster Mash' is about it. I wanted to change that." Though the skeletons of her songs are sing-along rounds ("I love rounds. They're harmony 101 for dummies."), there's plenty of musical meat on those bones. Pipe organ, strings, and harpsichord weave counterpoints as intricate as any spider's web, and influences run deep—from Camille Saint-Saëns' Symphony No. 3, which lent themes to "Cats in the Catacombs," to Richard Einhorn's score for Carl Dreyer's 1927 silent film *The Passion of Joan of Arc*. How did her journey begin?

"At age 12, I was actually tall enough to reach the pedals on the pipe organ. My teacher, Bob Cummings, noticed that I always preferred the Bach pieces that were in minor keys. As a reward for having practiced, he'd let me pull out all the stops! The majesty of that sound coming from all around you, it hooked me for life. Later, in September 2004, I was playing, appropriately enough, at a funeral. I kept hearing the children's song 'The Ghost of John' in my mind. I went home and wrote out the first four carols that day."

Kristen's mission to make Halloween as musical as Christmas received a major nod in October 2008, when she performed with Orange County's Pacific Symphony at their yearly "Spooktacular" concert. "Segerstrom Hall at the Orange County Performing Arts Center had recently installed a gorgeous, four-manual C.B. Fisk pipe organ. I can't believe I got to rehearse on it. I can't believe I still do. The console sits



JON MCFERSON

ROBERT CORNELL

A favorite of Kristen's, the C.B. Fisk pipe organ at the Orange County Performing Arts Center boasts four manuals and 4,322 pipes.

right behind the orchestra and under the pipes, because it's a tracker organ." That means that the keys are all physically connected to the valves that let air into the pipes, and it's only your finger pressure—not an electrical servo as on many modern pipe organs—that opens those valves. "Playing a tracker is a workout," says Kristen, "but there's nothing like it. The sense that you're functioning as the brain of this living, breathing creature is awe-inspiring." Stephen Fortner

KRISTEN'S GEAR

Korg Triton Studio

"It's my main controller. The harpsichord on 'Vampire Empire' is actually the 'HarpsiKorg' patch."

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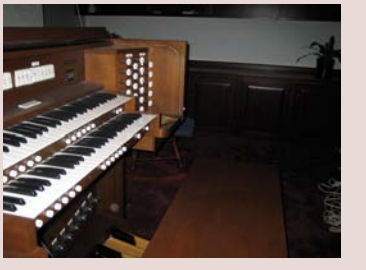

Allen MDS-35 Organ

"I'm lucky enough to have this organ at my parents' house. Allen makes such beautiful, well-built instruments. It's a joy to play."

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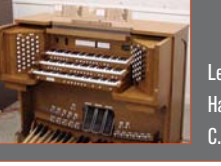

Learn more about Hauptwerk, Allen, and C.B. Fisk organs.

CALEB MITCHELL

MALCOLM JACKSON

Accidentally Major

Keyboardist and vocalist Malcolm Jackson never planned for a major-label sideman career. It just happened. The 25 year-old Bakersfield, California, native grew up amidst his family's record collection, in which the Beatles, the Beach Boys, and Pearl Jam got equal airtime. Later, Jackson came to admire the music and stage antics of piano rocker Ben Folds.

"I had never seen a pianist go where he dared to go," Jackson tells me. "I was amazed at how he'd just rock out on the piano, curse on the mic, and throw the piano chair over. He really got into it!" Jackson would form his own rock bands in Bakersfield during junior high, playing guitar and drums as well as piano. Later, he would move to Provo, Utah, where the dream of a career in music seemed to be slowly slipping away.

"I was working in a restaurant," he tells me, "playing piano and writing songs on my own, but planning on going back to school. I didn't think anything was going to happen for me musically." A chance meeting with local phenom Isaac Russell, a 17-year-old singer-songwriter with escalating indie buzz, would change everything.

"Isaac's family and mine have been close since we were both kids in Bakersfield," Jackson says. "We lost touch, and ironically, both ended up moving to Provo. When Isaac's brother Spencer heard me playing piano in church one afternoon, he told Isaac to call me. Unbeknownst to me, Isaac had been looking for a piano player. We started jamming, and everything just clicked."

Soon after, Russell would sign to Columbia Records, tapping Jackson to anchor his live acoustic duo tour to support his recent self-titled EP. While most bands try to emulate their studio releases live, Russell and Jackson find new stories to tell through acoustic versions of the album's songs.

"We realized that with just the two of us, we'd never recreate the sound of the album," Jackson says. "So we decided to make the setting more intimate, focusing on the guitar, keyboards, and vocal harmonies. The piano parts are similar to the album, but Isaac has a really unique guitar style, where he sometimes does intricate finger-picks, hammer-ons, and pull-offs. I try to build around that."

Live, Jackson uses a Roland Juno-Di, focusing on vintage sounds that complement Russell's guitar and vocals. "The Juno sounds great and is really portable. It has a lot of synth sounds, but I'm using it primarily for Rhodes, Wurly, organ, and piano—also flute, bells, and strings at times. For what we're doing as a two-piece, it has a great selection of sounds.

"As long as you keep yourself open to the opportunities around you, you end up where you're supposed to be," Jackson says. "I thought I might not ever make a living playing live, but I never gave up on the music." Jon Regen

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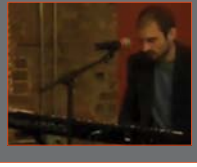
Isaac Russell site and tour dates.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Dave Buehler of Steelin' Dan

DAY GIG Early in my career, I worked in architectural acoustics—designing treatments for recording, performance, and worship spaces. Now I do environmental acoustics—studies to evaluate how sounds from things like highways, wind turbines, mines, and amphitheatres affect people. It's a nice way to incorporate my interest in math, science, and music into a reasonably stable career.

HOW I GOT STARTED I studied classical piano for ten years starting at age eight. When I was 12, my older brother started bringing home jazz albums. I sat at the piano and tried to figure out what was being played, and started to get a sense of what improvisation was all about. I played in my high school jazz band, and bought a Fender Rhodes my senior year. Later, I joined a rock band, and we played high school dances all around town.

BAND Steelin' Dan is a Steely Dan tribute based in Sacramento, California. We try to be as true to the records as possible. This is some of the most difficult pop music, created by some of the best musicians in the world, so you have to put in serious time and effort to pull it off. The singers, horns, and rhythm section generally rehearse independently, and it all comes together on the gig. We play mostly at outdoor summer concert series, regional theaters, and casinos.

LIVE RIG My Yamaha S90XS covers all the sounds I need for the Steely Dan songbook, with great piano, Rhodes, and Wurly sounds, and it handles the occasional marimba and strings nicely. The onboard phaser and chorus are perfect. We always use a full sound system, so my Roland KC-100 amp is just a monitor. If space permits, I'll bring JBL EONs to monitor in stereo.

INFLUENCES Les McCann was my earliest. Vince Guaraldi's *Peanuts* music left an impression on me as kid, and increased my interest in jazz. I love the way Keith Jarrett makes the piano sing. One of my near-term goals is to study Bruce Hornsby's music in more detail.

WHY I PLAY Sitting at the piano feels like home. If my music makes just one person's day better, I've succeeded.

MORE AT steelindan.com Ed Coury

MAJORminor

Henry Hershey

Henry Hershey is a jazz-loving sophomore at Westfield High in New Jersey, with a penchant for Bruce Hornsby, blues, and improvisation. In addition to piano, Hershey plays tenor sax in the school marching band.

First memory of piano: My grandparents' house in St. Louis, Missouri, with the whole family in the living room. We played a game where you pass something around a circle of people while music plays, and when the music stops, the person holding it is out. My dad provided the music—he'd play boogie-woogie and piano and improvise.

Age lessons began: Around five or six.

Musical influences: My teacher, Joe Kurasz of Rahway, New Jersey. I also admire Bruce Hornsby's harmonizing techniques on his album *Camp Meeting*.

Why piano? I think that piano is the most versatile instrument in the world. One can play practically any genre, from bebop to classical to rock.

Favorite music to play? Jazz and blues, because of the freedom they provide me. I can do whatever I want to the song to make it sound how I want at a specific moment.

How important is traditional training? It's important to learn the basics and start with a classical music teacher. That way, you learn the importance and discipline of practicing, and how to read music. Later on, one can switch to another genre if one isn't satisfied with classical. That's basically what I did, and it's working out pretty well.

Read music or play by ear? I read fake book-style music for jazz. I read the chords and melody, and the rest, my teacher and I make up. For example, on some songs we'll use a stride bass; in others, straight chords. To pick up a song on my own, I'll sit down with my iPod and learn it by ear.

Goals in life: Someday I hope to be a cardiologist. Maybe my interests will change along the way, but I know one thing for sure: I'll always find time to play piano. Jon Regen

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THE EDITORS' PLAYLIST

Jon Regen

RYAN STAR
11:59
Many will remember Ryan Star from his renegade run on the 2006 CBS reality series *Rock Star Supernova*, where his alt-rock piano panache catapulted him to solo success. On his Matt Serletic-produced major-label debut, Star surrounds himself with a cast of keyboard killers including Serletic, Kim Bullard, and Patrick Warren, who bathe his soaring pop choruses in an ever-evolving sonic glow. (Atlantic, rstar.net)

SOULIVE
Rubber Soulive
Who funked up the Beatles? Soulive, that's who! Just when you thought you've heard every imaginable Beatles tribute, Soulive serves up this booty-shaking, organ-grinding festival of funk. Right from "Drive My Car," keyboardist Neal Evans' blistering bass grooves like it's about to jump out of the record's grooves. Other standout tracks include the simmering "Come Together," and a surprising Chicago-meets-church romp through "Eleanor Rigby." (Royal Family, soulive.com)

FRED HERSCH TRIO
Whirl
With a silken piano touch and a seemingly limitless palate of improvisational interplay, Fred Hersch delights on his latest release. Featuring a melodious mixture of standards including a metrically-modulated romp through "You're My Everything," plus originals such as the affecting "Snow Is Falling," Hersch proves once again that his singular, supple piano sound is a force to be reckoned with. He's a modern musical master at the peak of his creative powers. (Palmetto, fredhersch.com)

Stephen Fortner

JOSH CHARLES
Love, Work, & Money
When it comes to New Orleans piano, it's no small feat to combine deep scholarship of the genre's musical complexities and cultural roots with the pop sparkle that seduces the uninitiated. Once a student of Dr. John, Josh Charles does this brilliantly on gems like the get-up-and-dance "The Waiting Game" and honey-dripping ballad "It Ain't Easy." Taste Charles' gumbo of stride, boogie, blues, and gospel, and find out why he's the new young lion of a uniquely American art form. (joshcharlesmusic.com)

STANTON MOORE
Groove Alchemy
Speaking of New Orleans, Moore may be the funkiest drummer since Zigaboo Modeliste, and Robert Walter's approach to the B-3 eschews playing lots of notes in favor of just the tastiest ones, on this top-to-bottom excellent album. Two highlights: "Squash Blossom" would make the Meters proud, and "Pot Licker" is how an organ trio would accompany a chase scene from *Cowboy Bebop*. This is deep-fried instrumental funk at its very, very best. (Telarc, stantonmoore.com)

Grace Larkin

THE BAD PLUS
Never Stop
The band's first all-original album is a detailed musical self-portrait. Painted with richly colored piano melodies and grooves, this album mixes funky drum pulses with clever bass lines, making for music that gets into your bones. Lyric-less throughout, the keys act as the vocalist on a number of the record's pieces with exceptions surprising us on tracks like "My Friend Metatron" where we feel the bass speaking to us, keeping us ever-interested in the sounds to come. (Entertainment One, thebadplus.com)

CHILLY GONZALES
Ivory Tower
Known for his production work with Björk, Daft Punk, and Feist, Chilly Gonzales reminds us why he's behind so many musical successes. He takes us on a poetic ride through his mind, which is that of a humorous and insightful rapper and meticulous pianist. His lyrical wits combined with his exquisite technique and fluid delivery are what set him apart from other songwriter-producers, making for an album more clever than anyone might have expected. (Arts & Crafts, chillygonzales.com)

Book Review

RECORD STORE DAYS: FROM VINYL TO DIGITAL AND BACK AGAIN
by Gary Calamar and Phil Gallo
Before the Internet reinvented the music-buying experience, the record store reigned supreme as the headquarters for the audio-obsessed. In this pictorial romp through the history of music sales, the authors leave no record sleeve unturned. With heartfelt commentary by the likes of Paul McCartney, John Mellencamp, and Bruce Springsteen, and a foreword by Peter Buck of R.E.M., *Record Store Days* is sure to bring out the nostalgic side of your inner music fan—even if you're young enough to be a "digital native." (sterlingpublishing.com) Jon Regen

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KORG

NEW GEAR

by Stephen Fortner

YAMAHA MOTIF XF

Concept: The next-gen Motif sets a new bar for integrated keyboard workstations.

Big deal: Factory sound ROM of 741MB is the largest in any workstation by a wide margin. Takes up to 2GB of Flash memory, which you can load with custom sounds: your own, or upcoming packs from such names as Garritan and Sonic Reality. These are retained with the power off.

We think: Yamaha has moved the hardware keyboard a big step closer to computer-like flexibility.

XF8 list: $4,039. Approx. street: $3,500 | XF7 list: $3,539. Approx. street: $3,100 | XF6 list: $2,999. Approx. street: $2,400 | yamahasynth.com

AVID HD OMNI

Concept: Integrated single-rack audio interface for Pro Tools HD.

Big deal: Converters are greatly improved over previous PTHD interfaces. XLR combo mic inputs on front panel. Monitor control of up to 7.1 surround, with mono fold-down and speaker selection. Works as mixer with computer off.

We think: This lowers PTHD's barrier to entry for spare-bedroom pros, as you no longer need several rackspaces of gear to feed those cards in your computer.

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Roland's "SuperNatural" technology gave us tweakable, ultra-realistic electric piano, drum, and brass expansions for the Fantom-G. Now, it does the same for acoustic and electric piano sounds in this high-end stage piano. Also on hand is Roland's best Ivory Feel keyboard with simulated escapement, plus a nifty Sound Focus knob that brings you forward in the mix even if you're at maximum volume, without adding compression or unwanted artifacts.

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DAVID LOWES

Misha Piatigorsky
ON BRAZILIAN JAZZ BASICS

What could be more addictive than Brazilian Samba? When I first heard pianist Cidinho Teixeira at New York's Zinc Bar in the mid-'90s, it was as if I'd discovered a whole new way to breathe music. Leading Brazilian jazz pianists such as Teixeira, Tania Maria, Sergio Mendes, and Eliane Elias all have two important things in common: a rich harmonic vocabulary, and an incredibly strong sense of the upbeat. Let's learn how these elements work together.

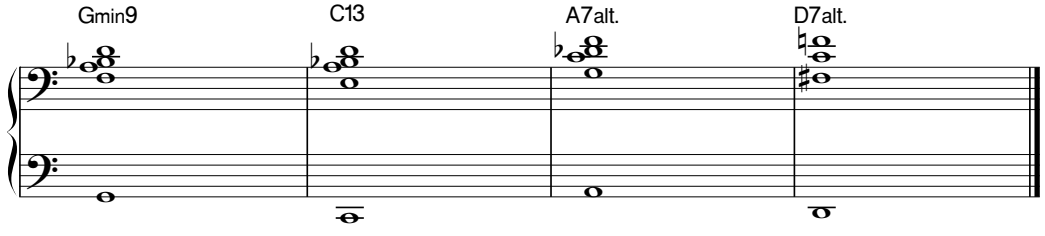
Brazilian tunes have much in common with jazz standards. They're usually packed with *ii-V* movement—minor-to-dominant progressions like *Cm7* to *F7*. **Ex. 1** illustrates typical Brazilian left-hand voicings that follow the Bill Evans style, where the chord doesn't include the root, but is built starting on the third or seventh. I'm also adding color tones, most noticeably on the dominant chords where I've altered the fifth and the ninth.

In **Ex. 2**, we use these chords as a template for soloing and comping. Start by playing bass notes in the left hand and rootless voicings in the right to see how they fit together. Brazilian music is usually written in 2/4 time, not 4/4, so we subdivide each of the bar's two quarter-notes by four sixteenth-notes. The upbeats are the second, fourth, sixth, and eighth sixteenth-notes in every measure. The bass line moves much like the way a jazz bassist would play on a swing tune.

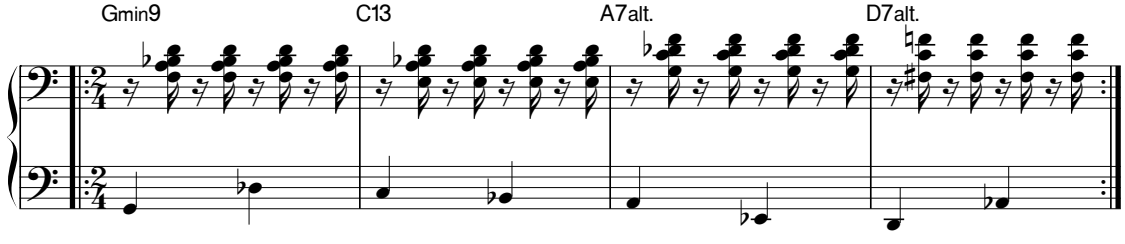
Ex. 3 illustrates a simple *F* major melodic pattern in the right hand, with our upbeat-centric comping in the left. Accenting the final sixteenth-note of each measure creates a swing feel in your right-hand lines. Try tapping your foot on beats 1 and 2 to bring out the groove.

In **Ex. 4**, I'm putting all these elements together. It's okay not to play all the time in the left hand. Often, I play upbeats in my left hand when my right is taking a break. When my right hand is busier, my left will either play sustained chords, attacking them on upbeats only, or not play at all.

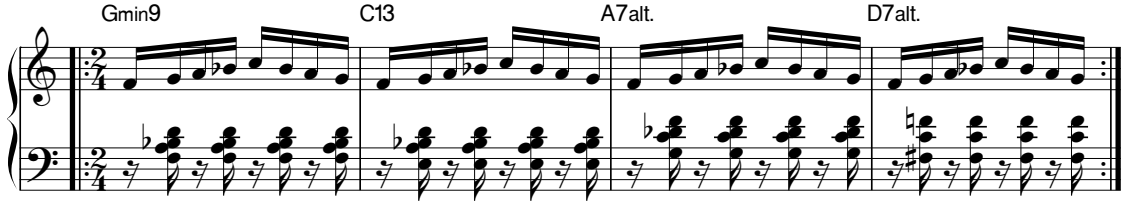
Ex. 1: Rootless Chord Voicings

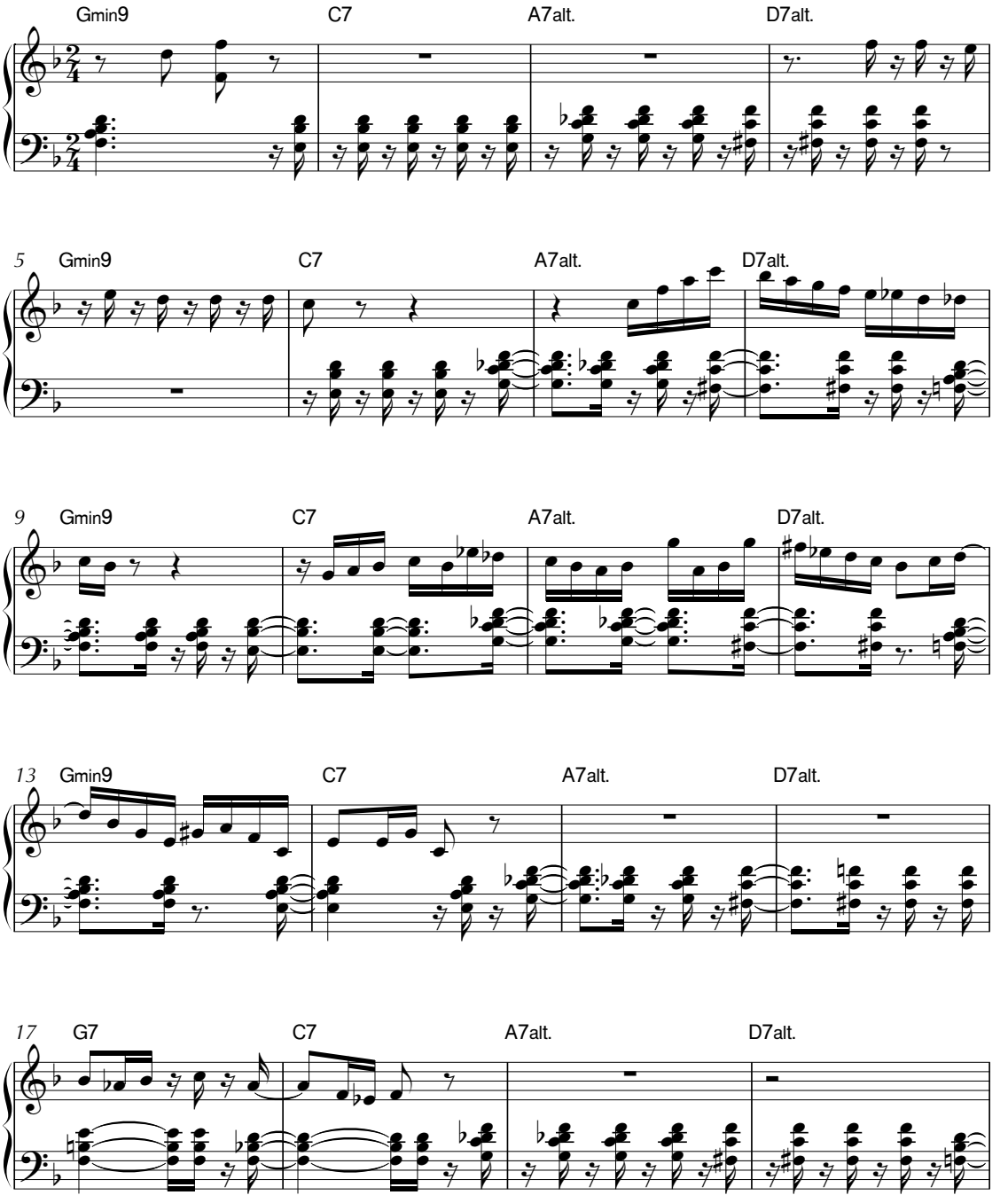


Ex. 2: Rhythmic Subdivision



Ex. 3: It's Got That Swing



Ex. 4: All Elements Together

Born in Moscow, **Misha Piatigorsky** began studying music at age five, immigrating to the U.S. at eight. After winning the 2004 Thelonious Monk Competition, Piatigorsky has stayed active as a sideman and a leader, anchoring his own trio and septet, as well as his band Paris Troika. Find out more at mishamusic.com. Jon Regen

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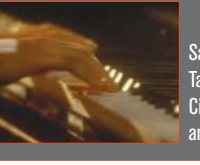


Samba videos by Tania Maria, Cidinho Teixeira, and Eliane Elias.

Misha plays audio examples of these lessons.

BOB MOOG FOUNDATION ARCHIVE

PAUL UNDERSINGER

Jordan Rudess started classical piano studies at the renowned Juilliard School of Music at age nine. Since then he has performed his own solo works, as well as with Dream Theater, Jan Hammer, and David Bowie. Find out more at jordanrudess.com. Jon Regen

Jordan Rudess

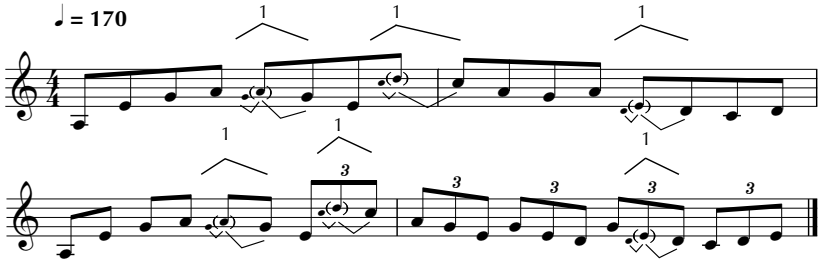
A PITCHBEND PRIMER

I still remember the day my high school buddies showed up at my door with a Moog Sonic V synthesizer, like the one shown above. After hearing Patrick Moraz shred a bendy Minimoog solo in the song "Someday" with his band Refugee, I bought a Minimoog of my own, and began practicing my own original exercises with pitchbends. Here are some tips and tricks to get you started in using this often misunderstood underrated means of musical expression.

A word about how I notate pitchbend in the examples: Notes *not* in parentheses are played physically, while notes *in* parentheses represent the pitch you *hear* due to pitchbend. V-shaped lines denote up or down movement of the pitch wheel. The numbers show the duration of the bend: either a whole step (1) or a half (1/2). Stemless grace-notes mean that you quickly bend the note right as you play it, so the bend has almost no rhythmic duration.

1. Blues/Rock Bends

Ex. 1 has an *A* minor pentatonic riff with bends you'd find in blues or rock leads. I'm bending from the third of the scale to the fourth, then from there to the fifth. I'm also bending the seventh back into the root. Here, I start with the pitch in the center, then bend up a whole step, before I drop back down to the note I originally played.



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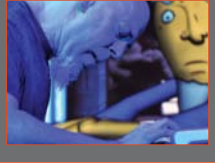
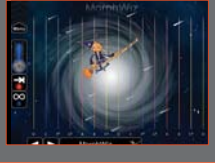


Jordan plays these audio examples.

Videos: Rudess interviews, synth, and apps demos.



Check out Jordan's amazing iPad synth, MorphWiz.

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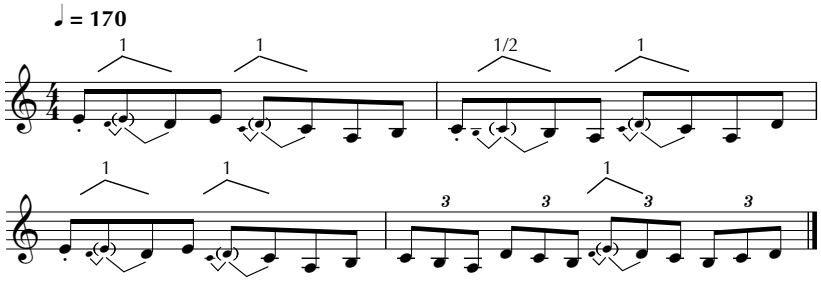
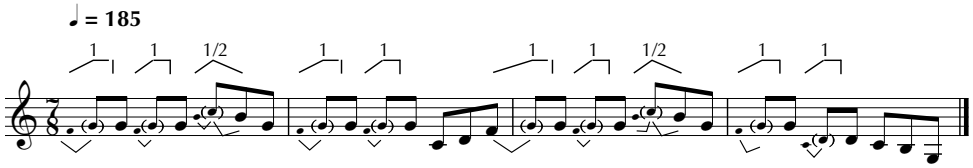
2. Interval Bends

The most common pitchbend setting on a synth bends a whole step up and down. **Ex. 2** demonstrates bending both whole and half steps. I sometimes set the bender to asymmetrical intervals—the up range to a whole step, and the down range to an octave. This lets me do whammy-type pitch dives.



3. Guitar Bends

Ex. 3 demonstrates how to start on a note, like the *F* at the top of this example, and bend the pitch up a whole step, then play that same pitch again without being able to hear the bender on its way back down. You can hear this technique on the song "6:00" from Dream Theater's *Awake* album.



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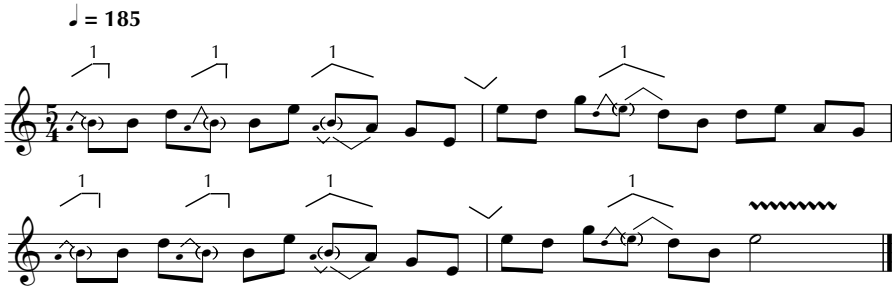
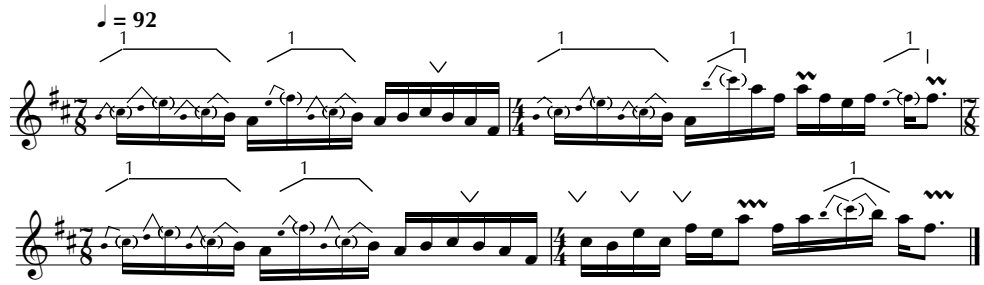
4. Upward Bends with Repeats

In **Ex. 4** we bend up to a note, then play that exact note again without a bend. Practice the first three beats in measure 1 as a loop to get the feel for this. The V-shaped figures at the bar lines denote quick downward scoops, and vertical lines at the end of a bend diagram mean you release the bend quickly before playing the next note.



5. Multiple Bends

Ex. 5 has bends where the pitch wheel is held up while multiple notes are played. Here, the first three eighth-notes are played physically (*B, D, B*) but sound as *C♯, E, C♯*, with a release to *B* on the fourth sixteenth-note. Note that I don't use the modulation wheel for vibrato–I use pitchbend exclusively.



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Bob Moog performing on two Minimoogs at the Strasenburgh Planetarium in Rochester, New York, in 1972.

BOB MOOG FOUNDATION ARCHIVE

The Minimoog at 40

From the Dawn of the Synth Age to New Voyages

by Peter Kirn

Hot on the heels of the first moon landing, building on what had been a modestly successful business in electronic sound, a small team of engineers at the R.A. Moog company unwittingly set the course of the modern synthesizer. Forty years later, what came out of their workshop still defines essential ingredients of electronic instruments, in ways musicians have since taken for granted.

The story of inventions is an odd thing, in which each dial on the invention is a potential path into an alternate history. In this case, hand-sawed wood, half-broken parts, and reverse-engineered airplane controls combine with ingenious engineering personality to produce Moog's first great hit. Of course, the story isn't over. Moog Music's resurrection of its founder's name, with a successor to the original Minimoog, has proved a winning formula for a new generation of musicians. Led by the Voyager line, the Minimoog may be bigger than ever before.

The Birth of the Minimoog

The Minimoog really was the first recognizably modern synth. In 1969, the word "synthesizer"—whether Moog or any other maker—meant complex, expensive, heavy, large, and fragile modules and patch cords. The need for something new was clear. It was certainly apparent to Bill Hemsath, the member of the Minimoog team who constructed the original prototype with Bob Moog.

"One of my jobs was to demonstrate products to potential customers," says Hemsath. "We had a Model III—a large studio synthesizer with dozens of modules. Every time, I'd plug the oscillator into the filter and the filter into the VCA—probably six patch cords, total. It occurred to me after a month or two of this, what if I built a box that way?"

With the need to replace the Moog modular racks with something portable, Robert Moog hired outside consultants to do drawings of what

THE NEW VOYAGER XL

Wondering what that stretch-limo Moog on our cover is? The Minimoog Voyager XL restores a full keybed for the first time since Bill Hemsath hacked off the spare one to build the Model A. With 61 keys and a ribbon controller, it's bigger than any Voyager before. It also brings back patching, but in a friendly, integrated patch panel that keeps the cords out of your way. "The extensive patchability harkens back to Moog Modular synths," says Marketing Director Chris Stack. "A four-channel CV mixer, two-channel attenuator, lag processor, and MIDI-synced LFO make this a dream machine."

the case might look like. The resulting concepts were fitting for the Space Age. "They look like spaceships with curved backs—silly, but lovely," Hemsath recalls. "I think they did a dozen of those futuristic things. Down in the corner was this little, square wooden box with a flip-up lid."

As Bob Moog once recounted in *Keyboard*, a quick poll of musician friends revealed that they preferred the "natural wood and simple lines." Hemsath remembers a more practical reason: "Everybody said, 'I can make that. I can build that.' So we threw out all the curved stuff, and Bob and I came in the next Saturday morning to the woodshop and just started sawing until we had that."

The future of the synth may have been determined by just which junked and cannibalized parts lay in storage. "There was a five-octave keyboard that [Bob] would steal keycaps off of to replace chipped and broken ones," Hemsath remembers. "Then there was an upper console case—it was four feet long but the end was broken out. So I got to work on the keyboard. The number of remaining keycaps determined its size, which turned out to be three octaves. So I hacksawed that down. There was a smashed keyboard case, and I cut it down to match. Originally, [Bob] had the portamento control on the left cheek. That was missing, so there was a little notch in the left cheek. And I needed something there. Well, how about a slider? That'd fit. So the forerunner of the wheel was that slide pot, just to fill that space."

The result was the shell of what would become the Model A, the first Minimoog prototype. Hemsath bolted together modules from spare and rejected parts. "I'd sit down at my desk and take an apple out of one drawer and a module out of the other," he says. By his count, just one model 901A oscillator was fresh stock; everything else was salvaged from Moog's junk bin.

Even this Frankenstein-like model was already taking the shape the Moog team wanted. It was the synthesizer as *discrete object*—something Bob Moog had built years before, with his suitcase synth kit, but now with some of the sophistication of the modulars. "You could carry this thing around," beams Hemsath, even today. "It was a complete synthesizer in one hand."

With Bob Moog, Jim Scott, and Chad Hunt, the design was refined over four models, culminating in the Model D manufactured for the public. Each model introduced new innovations (see "Thank a Minimoog" on page 36). The great achievement of all of this is the lasting power of the Model D design. Introduced in 1970, it was still made in 1980, and remains highly sought-after today—not only because of the vintage-cool factor, but because it's still *useful*, a Stradivarius for the 20th century. Hemsath takes pride in the fact that it didn't change. "Ninety-five percent of the stuff in there [in 1980] was what we designed in 1970. Something that would remain in production for ten whole years—that, intellectually, is what I like more than the sheer numbers sold—the fact that we did a good job the first time out."

In the summer of 1970, the Model D was ready for manufacturing and introduced to the world. Dick Hyman, the legendary jazz pianist and composer, presented its debut at a public performance at the Eastman School of Music.

A Crossover Hit

The Moog company wasn't aiming especially high in sales. According to Hemsath, Bob Moog expected to sell a lifetime total of 200. When the last Mini rolled off the assembly line in 1981, the company had sold well over 12,000—a success unheard-of in the modular era.

That doesn't mean the reception was immediately enthusiastic. In June, 1971, R.A. Moog ehxibited the Minimoog at the NAMM Show. "We did not experience a warm reception," said Bob Moog. "Most of the dealers didn't know what to make of an instrument with words like 'oscillator bank' and 'filter' on the front panel. Retailers would pass our booth and ask questions such as 'What's that?' and . . . 'You expect me to sell that in my store?'" Moog conceded that part of what was lacking was "convincing musicianship" to demonstrate the creation—that perennial challenge for new music technology.

As with the Moog modular and Wendy Carlos, the ambassadors of the Minimoog again proved to be musicians. In Bob Moog's eyes, they "showed us all what the instrument was capable of. Keith Emerson nailed its analog sound into the vocabulary of rock, first on his modular behemoth and then on his Mini. Then came Jan Hammer, who developed

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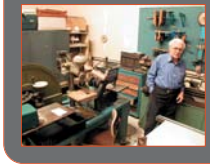

Bob Moog talks about the making of the Minimoog Voyager.

Our reviews of the original Minimoog Voyager and Voyager Old School.

incredible chops with the left-hand wheels. The playing styles developed by both Emerson and Hammer, along with Chick Corea, Rick Wakeman, and many others transformed people's ideas of the Minimoog from something akin to a box full of knobs to an expressive musician's axe."

An Imperfect Classic

The Minimoog's endurance doesn't mean it was perfect. Hemsath regrets not including velocity sensitivity: "There were three contacts on each key. One was for pitch, but the trigger had both a front and a back contact. We never used the back contact. If we had, we could've done velocity sensing."

One flaw is also part of what makes the Minimoog beloved. "Jim Scott did the filter and the voltage-controlled amplifiers," recounts Hemsath. "He made a calculation error, and he overdrove the filters by ten or 15 dB, something like that. If you look at, say, an ARP synth, it was crisp and clean, and it was beautiful and sounded like water. Our instrument had punch to it, because we inadvertently overdrove the filter like crazy. Nobody knew that until a month or two before we started production, and then everyone said to leave it alone."

The rest of the Minimoog's appeal lies somewhere between the mathematical and the ineffable. Hemsath notes the commitment to discrete transistors in favor of integrated circuits—the latter, while perfectly usable now, were "terrible" in 1970. Bob Moog credited the Minimoog's success to the sum of many design decisions: "The warm, low-order distortion introduced by the VCF and the VCAs, the rapid attack times of which the [envleopes] are capable, the small amounts of noise in the oscillators that keep them from locking together at very small frequency differences, and the frequency response as a whole. I also believe that musicians like the Minimoog because its controls have a comfortable feel." But he also ascribed something beyond engineering: "Our own intuition and discretion were our most important tools. In this respect, we performed like artists rather than engineers."

The Return of Moog

The irony of the Minimoog's triumph is that not long after its introduction, a chain of events set into motion the business transformation that would eventually cause Bob Moog to lose access to his own name. Dr. Moog himself left in 1977, the company he left behind failed to keep pace with competitors, and quality suffered. The Norlin-owned Moog Music shuttered in 1986, leaving Bob Moog with his own Big Briar company, which returned to the small-scale electronics and Theremin that had first inspired

VOYAGER TIMELINE

2002
Signature Edition
The first Voyager added extensive modulation, touch control, MIDI, and preset storage to make a better Minimoog than the Minimoog.

2003
Performer Edition
Looked similar to Signature Edition, but increased memory to 7 banks of 128 presets.

2004
50th Anniversary Edition
Limited run commemorating 50 years since the original R.A. Moog company started.

2005
Electric Blue
Added custom-color trim and blue backlighting.

2005
Rack Mount Edition
Voyager sound and knobs in a compact rack format.

2006
Voyager Select Series
Offered a choice of six different backlight colors and seven wooden cabinets.

2008
Voyager Old School
Recalling the Model D, this retro Voyager skipped MIDI and preset storage to go all-analog. Even the knob positions weren't scanned digitally—it was pure voltage.

2010
Voyager XL
Eight years after the original and 40 years after the Model D, the XL adds 61 keys, ribbon control, a MIDI-synced LFO, and onboard modular patch panel.

AvantGrand – at Home on Stage

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YAMAHA
AVANTGRAND

THANK A MINIMOOG:
DESIGN BREAKTHROUGHS

[Special thanks to Dave Kean and the Audities Foundation for these pictures of rare Moog protoypes. Visit them at audities.org. –Ed.]

Model A: simplified controls. Bill Hemsath's "demo patch" was the basis of a musician-friendly, ready-to-play instrument. Said Bob Moog in *Keyboard*, "You couldn't do much with it, but you could create some basic analog sounds, and–more importantly–you could play the instrument in real time. Remember, this was a long time before synthesizers had presets. The Model A had few controls, so a musician could remember how everything was set without having to stop and study a front panel jungle. For that reason, every musician who tried the Model A liked it."

Model B: no more patch cords. Hemsath recalls just how tedious re-patching instruments could be. Case in point: composer Dave Borden and his trio in Ithaca, New York. "They showed Mickey Mouse cartoons while the musicians were patching," says Hemsath. "At the end of the cartoon, they'd play the next number. Some of the people came for the cartoons." Not so with the Minimoog.

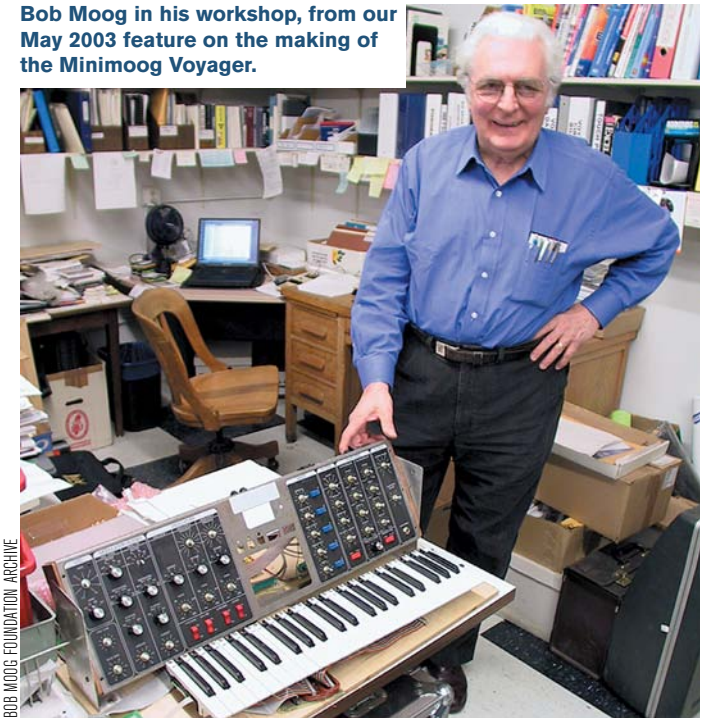
Model C: pitch and modulation wheels. The now-famous wheels began a long evolution that started with a joystick. The company needed to work through a list of dozens of promises Bob Moog had made, literally phoning those people to confirm they wanted this or that feature. Hemsath got the joystick.

"I started out with a model airplane joystick," he says. In order to correct nasty slop and backlash, he stripped it to three moving parts, two pots and a stick, which later became a module on the Moog price list. "I couldn't use the joystick for [the Minimoog] because it's got this one-inch square hole. Cigarette ashes, flies–anything could get in there. It ocurred to me to split the X and Y axes apart. I think originally I had two 'ciagrette' levers: one for modulation, one for pitch." Machinist Don Pakkala turned those levers into wheels, adding a center detent for pitch.

Model D prototype: Temperature-stable oscillators. Oscillator drift was still a reality on the Minimoog, but in an essential step for portable instruments, it was the first Moog with proper temperature resistance. "Somebody brought one in from Binghamton in the middle of winter," says Hemsath. "It was, like, zero degrees out, and this had been in his trunk all night long. He brought it in, plunked it on the bench. We turned it on, and it was in tune. Yes! We succeeded."

A retail-friendly synthesizer. Complex and fragile modulars downright scared music resellers, but the Minimoog was different. It took a salesperson to realize its potential. As Bob Moog once told *Keyboard*, "Starting in central Florida, David Van Koevering introduced the Minimoog to instrument retailers on their own turf, wielding his unrestrained enthusiasm to close sales. If it weren't for Van Koevering, the rest of us might have concluded that Minimoogs were unsalable."

Bob Moog in his workshop, from our May 2003 feature on the making of the Minimoog Voyager.



BOB MOOG FOUNDATION ARCHIVE

his love of synths.

The story might have ended there. Instead, the second coming of Moog has proven a turning point in the saga of the music technology business. In 2000, Bob Moog announced that he would make a new Minimoog. In 2002, he reclaimed the trademark not only for Moog Music, but for "Minimoog." With a new team in place, the father of the modern synth chose to tackle the unthinkable: Make a successor to the best-known synth of all time that would not only replicate, but best the original.

Demand for what would come to be the Minimoog Voyager was immediately astonishing. "When Bob announced he would introduce a successor to the Minimoog, there was a huge response." recalls Mike Adams, president of Moog Music. "We literally had millions of dollars in preorders for this undeveloped instrument."

The Voyager itself, now eight years on the market, has already proven its staying power. Guided by Bob Moog, the design combined the distinctive Minimoog sound and voltage control with new enhancements that reimagine the instrument for the 21st century. Unlike virtual analog synths, the Voyager boasts all-analog audio paths and, more importantly, control voltage. In fact, its modulation routings are significantly more flexibile than the original. It also adds features that 1970 buyers couldn't have imagined, like a touchpad controller, MIDI, and preset storage.

Moog Marketing Director Chris Stack emphasizes that the return to control voltage, alongside other ways of "touching" sound on a modern Voyager, is part of the appeal. "The design and topology of Moog gear plugs musicians into the fundamental building blocks of sound in unique and musical ways," says Stack. "Whether it's controlling the Voyager's analog oscillators through its touch surface or bending the strings of the Moog Guitar, players are in direct contact with the source of their sound. This results in some of the most expressive music ever made."

For a perhaps surprising illustration, look no further than the success of the limited-run Voyager Old School reviewed in *Keyboard* in October 2008. While based on the Voyager, the Old School returned to a Model D-style case, dropped the touch controller and, controversially, eliminated

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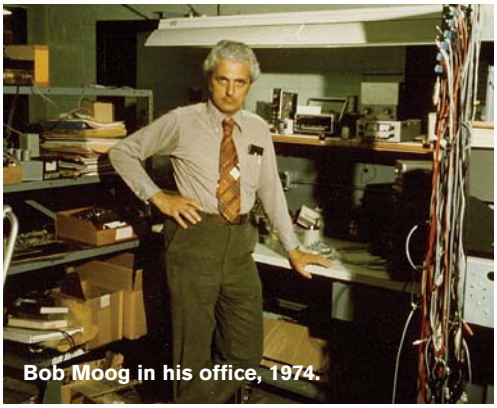

BOB MOOG FOUNDATION ARCHIVE

Bob Moog in his office, 1974.

presets and MIDI, turning the clock back to 1970. Signs at the 2008 Winter NAMM Show read "Are You Old School?" (On the website createdigitalmusic.com, an anonymous Moog employee reported that the original suggestion was, "Got Balls?")

Some worried that the Old School would have limited appeal, but it was a huge hit. "After its introduction, we were amazed by the music that was being produced with it," says Chris Stack. You can partly thank what's happened outside the Moog case: "Software such as Ableton Live lets musicians record Old School notes, riffs, sound effects and more and arrange and process them in ways that was difficult or impossible back in the heyday of the Model D," Stack notes.

The Voyager continues its forward march. The Moog DNA is found in the Voyager, in the wildly successful Little Phatty, in the Moogerfooger effects, and now in the Taurus 3 (reviwed on page 60). Most significantly, this year the Voyager gets its biggest upgrade—literally. See "The New Voyager XL" on page 33 for more.

Generation Moog

None of this success would have happened had a new generation not embraced Moog with open arms. "Inspired by the likes of Kraftwerk, Devo, Yes, ELP, Wendy Carlos, Bennie Worrell, and Giorgio Moroder, new, younger artists have rediscovered synth-laden sounds," says Moog's Emmy Parker. MoogFest started out as as a small nightclub event in New York City. Now in Moog's home of Asheville, North Carolina, it has become a mecca, this year having grown into a three-day, multi-venue music festival offering a lineup from MGMT to Devo to Massive Attack. The programming strays far enough from traditional synth territory that public radio personality and *Echoes* host John Dilberto accused MoogFest of being "just another hipster alt-rock festival." In *Keyboard*'s opinion, Moog Music and the Bob Moog Foundation should take that as a compliment about their rising profile in our comparatively synth-averse pop culture.

In fact, the name "Moog" inspires the kind of grassroots loyalty that automobile and soft drink makers spend billions trying to drum up. Without the slightest urging, Moog fans famous and unknown express their affection. "In just the last few weeks we've seen it show up in photos from Trent Reznor's studio and onstage in Björk's new live DVD," says Stack. "Just as gratifying are the huge number of YouTube videos we see of Voyager users in their home studios, pushing the sonic boundaries in ways we haven't imagined."

Perhaps that's the ultimate achievement of the Minimoog. Without it, Bob Moog would certainly still be remembered for his pioneering work in electronic sound. But with it, some 40 years later, the second most popular word for "synth" after "synth" is "Moog." k

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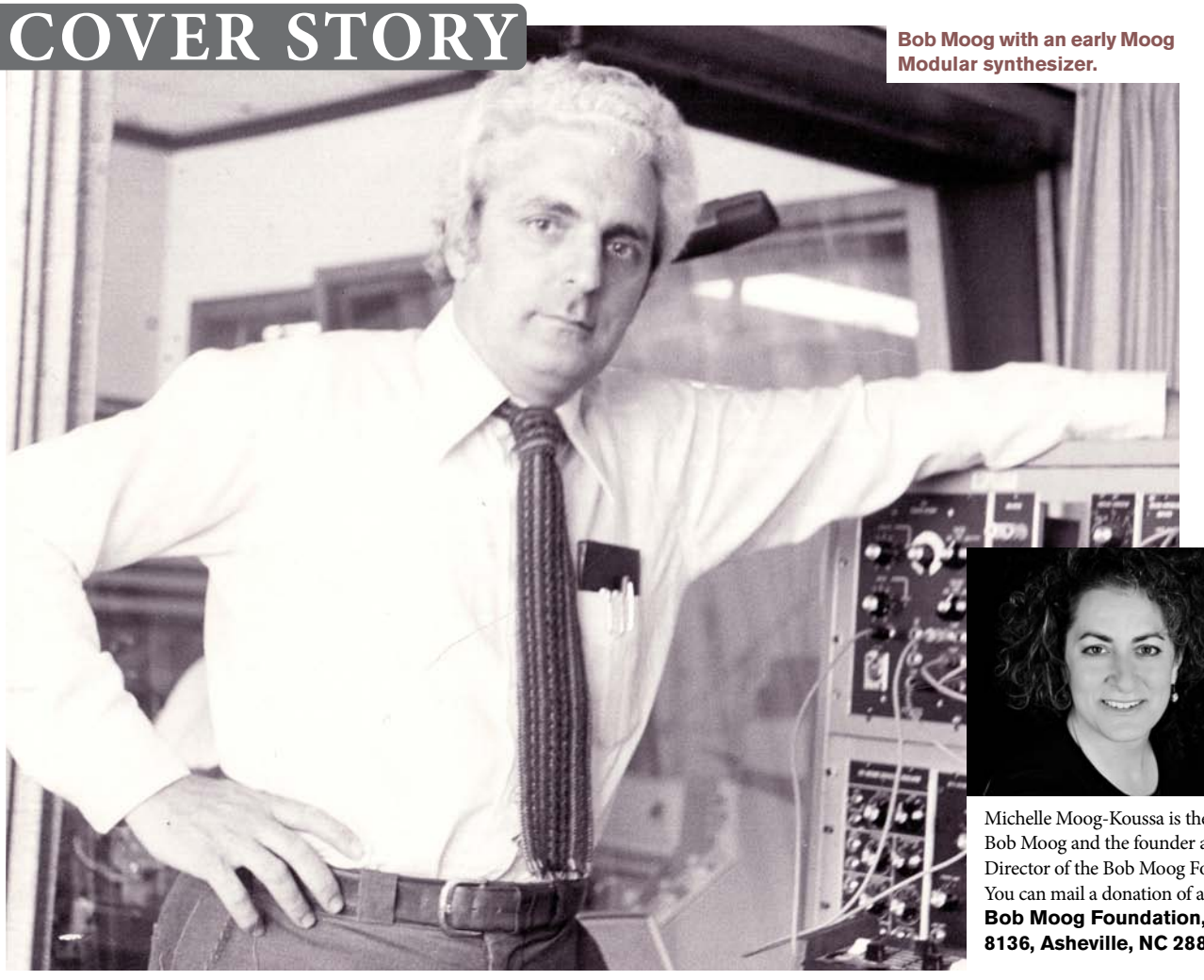


Bob Moog with an early Moog Modular synthesizer.

BOB MOOG FOUNDATION ARCHIVE

Michelle Moog-Koussa is the daughter of Bob Moog and the founder and Executive Director of the Bob Moog Foundation. You can mail a donation of any size to: **Bob Moog Foundation, P.O. Box 8136, Asheville, NC 28814.**

BOB MOOG LIVES

Through education programs, a historic archive, and a planned museum, the Bob Moog Foundation carries on his legacy.

by Michelle Moog-Koussa

April 29, 2005 is a date I will never forget. While working at my gift boutique in Asheville, North Carolina, my father called to share the reason he'd been having trouble moving his left arm. He'd had an MRI a few days prior, and the results were in. "Well, I don't have a pinched nerve," he declared with authority, "I have a brain tumor."

With this five-word pronouncement, my whole world shifted. My dad? My pillar of quiet wisdom and logical thinking? He hardly ever had a cold, or any major health issues. How could a human being so resilient suddenly be weakened by something so damning?

Three months and three weeks later, on August 21, 2005, my father died. He was barely 71 years old.

The emotional devastation was countered by a stunning revelation that came by way of the Internet. At the beginning of July, as Dad's health declined, my brother Matthew created a page on the CaringBridge website (caringbridge.org) as a way for the family to keep close friends informed of Dad's condition. Before we knew it, more than just close friends were visiting the site. What happened between July 7 and August 21 was an outpouring, with over 80,000 people logging on.

During these seven weeks, thousands of people wrote tributes to Bob Moog in the guestbook of his CaringBridge webpage. My family and I read them all, and we were overwhelmed at the depth of connection expressed from all over the world. People from 70 countries expressed such sentiments as, "Bob Moog gave me a voice for my creativity," "Bob Moog changed the face of music forever," and "I'm a musician because of Bob Moog's instruments."

This was an awakening. My cool, geeky, wise, ever-humble dad was also Bob Moog, Electronic Music Icon—an inspiration to thousands of people around the world.

The Birth of the Foundation

From this remarkable breadth of support, my family realized that our father had left a profound and indelible legacy steeped in inspiration, creativity, innovation, humility, and human interconnectedness—a legacy, we felt, that must be carried forward. Hence, the Bob Moog Foundation was created.

I began as Volunteer Director of the Bob Moog Foundation in September 2005, and became full-time Executive Director in February 2007. We were, and in many ways still are, a quintessential startup—highly motivated to succeed, inspired by technology and the urge to share it, and continually fighting for the resources to accomplish our mission. Given that we're an entirely separate entity from the current Moog Music

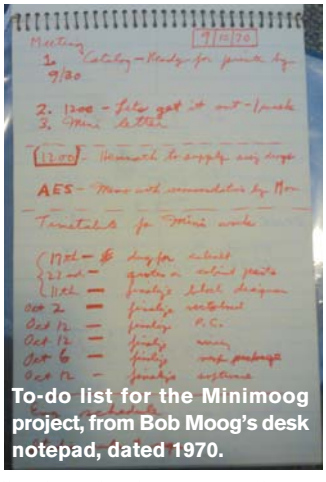
instrument company (though we do enjoy a friendly partnership with them), and that my father cared far more about making circuits sing than about his bottom line, we've faced our share of financial challenges—and are proud of the work we've done in overcoming them. This progress has been the result of thousands of hours of dedication, persistence, and hard work by countless volunteers.

Our mission is a reflection of Bob Moog's legacy: To educate and inspire people through the power and possibilities of electronic music, and through the intersection of music and science. On the ground, three important projects are how we realize that mission.

JOHN LEIDEL FOR BOB MOOG FOUNDATION

• With our **MoogLab Student Outreach** project, we bring Moog instruments into schools to teach children the math and physics behind electronic music and inspire them to create in their own ways. More about that below.

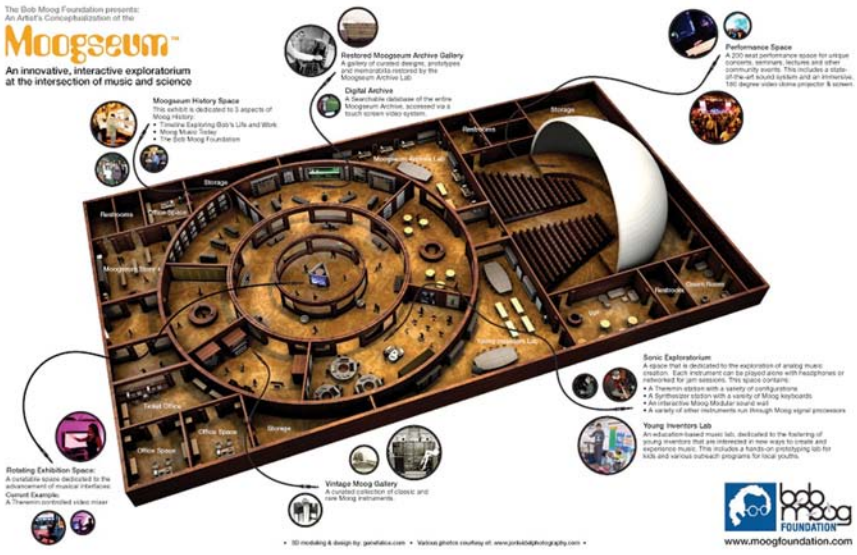
• **Archive Preservation Initiative**: Bob Moog left behind an extensive, compelling, and historically rich archive that includes photos, schematics, prototypes, project notes, articles, correspondence, and audio recordings, all of which we're preserving. Currently, we're restoring and digitally transferring some of the most delicate specimens in the archives—the reel-to-reel tapes—thanks to two generous grants from the Grammy Foundation. Our goal is to bring this unique archive to life through our website, traveling exhibits, and our future Moogseum. The Museum of Making Music in Carlsbad, California recently hosted an eight-month exhibit featuring over 250 items from the archives. It received over 20,000 visitors.



BOB MOOG FOUNDATION ARCHIVE

To-do list for the Minimoog project, from Bob Moog's desk notepad, dated 1970.

• **The Moogseum** is planned to be both a website and a facility in Asheville where the above two goals converge in a hands-on, interactive environment. Asheville's Tourism Product Development Authority has awarded the Bob Moog Foundation a generous lead grant for the construction of the facility. The challenging economy has made raising the remaining needed funds difficult, postponing the opening of the Moogseum to 2014 or beyond. In the meantime, we continue to grow the MoogLab and Archive projects so that both will be fully developed by the time the Moogseum is realized.



MoogLab Unleashed

With school music and arts programs suffering across the country, and U.S. science education lagging behind other developed countries, the Bob Moog Foundation is committed to making an impact immediately with MoogLab. To date, this has been a pilot program we've brought to area elementary and middle schools, festivals, and our own public events.

To introduce students to the physics of sound, we follow the trajectory of electronic music evolution and begin with the Theremin, the very instrument with which Bob got his start when he was only 14. Bob considered the Theremin, invented in 1919 by Russian physicist Leon Theremin (a.k.a. Lev Teremen) the cornerstone of electronic music, and of his own work specifically. The fact that you play it without touching it makes for a captivating visual with which to teach kids the principles of oscillation as a form of sound generation, electromagnetic fields, and circuitry.

As part of our lesson, our trained teachers connect the Theremin to an oscilloscope and the proverbial circuit is formed: Students hear the sound, watch the waveform, and interact with the instrument to make it all happen. The expressions we've seen on the kids' faces have shown priceless "light-bulb moments." This is MoogLab in action.

"Not now, Mom. I've almost got this tap delay synced with the filter mod."

We add a layer of sonic experience by connecting the Theremin to one or more Moogerfoogers, Moog Music's effects pedals, many of which are beautiful expansions on early modules designed by the R.A. Moog company in the mid-1960s. The Moogerfoogers introduce students to the concept of synthesis—the ability to alter sound waves with the flip of a switch or the tweak of a knob. With the Low Pass Filter, we use swooping filter sweeps to teach basic subtractive synthesis; with the Analog Delay, we use trippy echo effects to go deeper into waveform concepts.

Whether we're talking about oscillators in a Theremin or filters in a Moogerfooger, Moog devices provide a unique onramp to subjects ranging from the relation between mathematical frequency and audible pitch

to the difference between digital and analog sound. They also wed these concepts with fun, real-life examples. Even if students can't fully grasp such complex subjects in a single teaching session, the connections forged in a MoogLab class between math and music, science and sound, prove to be valuable assets as their education continues.

Synthesizers such as the Minimoog Voyager are possibly our most powerful tool for teaching the science of sound, but they're also the most complex, and therefore better suited to upper grades. While we've not yet brought MoogLab into high schools, our goal is to do so within the next two years. Bob Moog designed his synths to have logical, intuitive interfaces, and to be easy to understand for musicians. This also makes them ideal teaching tools. Many musicians have told me that they taught themselves synthesis on a Minimoog Model D, and that the experience shaped their musical lives. We aim to offer that same experience to a wide range of students in hopes of unleashing their creativity.

The Bob Moog Foundation aims to follow Bob's ethos of doing things right the first time. That's why we're spending some time developing MoogLab in the Asheville community—we want to sculpt it into a refined teaching tool that we can eventually share with teachers on a national and international scale.

Make Waves

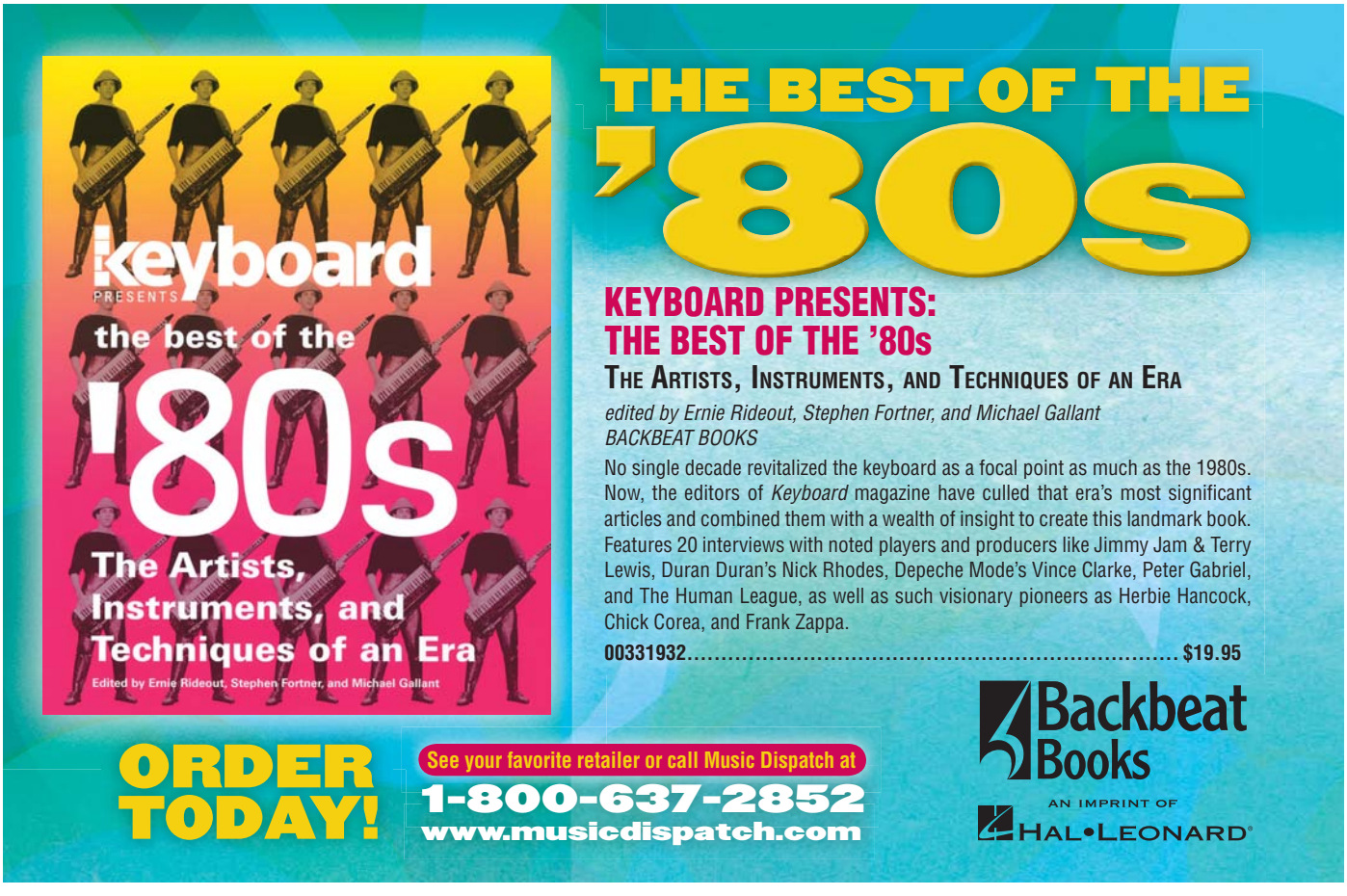
The most important thing we can do is to continue to impact lives in the way that Bob did. MoogLab and the many history lessons hidden in the archives serve as powerful vehicles, opening minds to the possibilities that exist at the intersection of music, science, and imagination. Make no mistake, the Bob Moog Foundation is not about Bob-Moog-as-celebrity. Rather, it's about igniting creativity and stoking intelligence in present and future generations.

To carry out this work, we look for the collaborative spirit in those who care deeply about electronic music. We seek the support of musicians who use tools that Bob dedicated his life to developing—as well as the support of fans who enjoy the vast ocean of music that might not exist if it weren't for Bob's work.

My father was not just a brilliant technician, but also a generous soul. For that reason, and in spite of his renown, he left behind relatively little personal wealth. The Bob Moog Foundation is a small non-profit organization with one full-time employee (me) and a corps of dedicated volunteers. While we receive some funding from grants and fundraising events, we'll always be mainly donor-driven and sincerely appreciate all sizes, shapes, and flavors of support—see the "dashboard" on page 44 for different ways you can help.

The Gift of the Driver's Seat

I've been acquainted with *Keyboard* magazine since I was a kid. Dad, who could be a bit of a procrastinator, used to write a monthly column called "Vintage Synthesizers." [*He also authored our instructional "On Synthesizers" column and myriad one-shot stories, including a renowned article*


keyboard
PRESENTS
the best of the
'80s
The Artists, Instruments, and Techniques of an Era
Edited by Ernie Rideout, Stephen Fortner, and Michael Gallant
THE BEST OF THE '80s
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edited by Ernie Rideout, Stephen Fortner, and Michael Gallant
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BREAKING THE RULES... AGAIN!

RULE #1 – AN 88 NOTE WEIGHTED ACTION KEYBOARD MUST BE HEAVY

Weighing in at an unbelievable 24 lbs, the PX-3's scaled weighted hammer action redefines the stage piano category. With an Ivory Touch matte key finish and the feel of this remarkable Tri-Sensor action, you'll never believe that you can carry the PX-3 under one arm.

RULE #2 – IT MUST BE EXPENSIVE

The PX-3 offers four layer dynamic stereo piano samples, editable sounds, insert effects, a backlit LCD and more. It only sounds like it costs thousands.

RULE #3 – A STAGE PIANO CAN'T CONTROL OTHER GEAR

The PX-3 allows for 4 simultaneous sounds. These can come from the PX-3's great sound engine, an external MIDI device or both at the same time. Use it on stage or in the studio with your computer, the class-compliant USB MIDI interface works seamlessly on any Mac or PC.

RULES WERE MEANT TO BE BROKEN

The Privia PX-3 breaks all of the rules and more by delivering an extremely lightweight, high performance, 88 note weighted action stage piano and controller at a price that is an absolute steal.

CASIO

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on the synth soundtrack to Francis Ford Coppola's film Apocalypse Now *in the January 1980 issue. —Ed.*]

One day he announced that then-editor Dominic Milano had called and said the article had to be at *Keyboard*'s offices across the country the next morning. Dad spent the day huddled in his workshop, banging out yet another technically stunning article. I was 15 going on 16 at the time, and about to get my driver's license. At the last minute, Dad asked me to drive him to FedEx, which closed in 30 minutes. We lived 35 minutes from town. I wondered for a split second how he could even trust me with such a responsibility, as there was so much riding on it and I was a brand new driver. Then I realized that if Dad trusted me, I should seize the opportunity.

We made it to FedEx five minutes early. Dad got out and asked me to wait in the car. He got back in a few minutes later and said, "I think we can go get your license tomorrow."

Once again I find myself in the driver's seat, with even more responsibility. Foremost is cradling Bob Moog's legacy with integrity for future generations to enjoy. This is also a gift for which I'm deeply grateful—an opportunity to make a difference in a truly meaningful way. Thanks, Dad, for blazing the path that I, along with countless others, trace with humility and awe. And thanks for the inspiration.

WAYS YOU CAN HELP THE BOB MOOG FOUNDATION

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Volunteer, donate, or buy cool swag at moogfoundation.org.

Make music? Donate a track to sell on the Foundation's iTunes store.

Rock out at MoogFest 2010, which gives the Foundation $1 for every ticket sold.

Donate part of your eBay proceeds to the Foundation via MissionFish.org.

Donate signed CDs or memorabilia for auction on the Foundation's eBay site.

Vote for the Bob Moog Foundation at Pepsi's Refresh Everything grant site.

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TJ TEXT & BILD

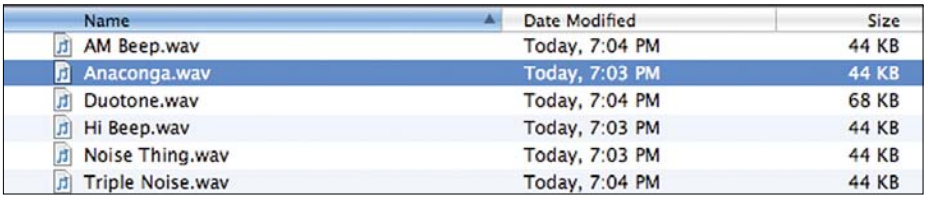
Dance

PERCUSSION GROOVES FROM SCRATCH

When whipping up a groove for a new track, it's all too easy to just grab a few percussion loops from your favorite library, lay them into your mix, and grab a latté. But what if you went to a four-star restaurant and the alfredo sauce came from a box? Eew. This month, we'll tackle putting your own stamp on your electronic percussion elements. Even if you're not a veteran sound designer, rhythmic loops that are entirely your own will ensure that you sound like no one else—a sure-fire way to stand out from the pack. Francis Preve

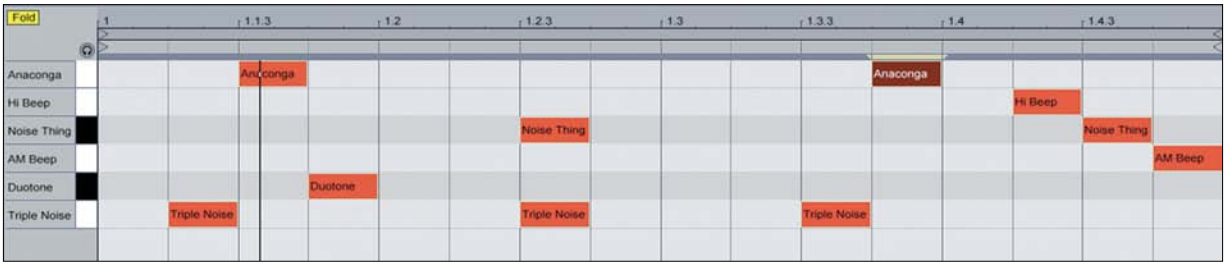
Step 1. Make a small array of short sound effects using whatever synths you like. The only criteria is that you don't use any presets. While we normally frown upon simply turning random knobs until it sounds cool, this is one situation where you can get away with it. Start with four to six unique sounds and make sure they're complimentary, but don't sound too much alike.

For best results, use short envelopes: immediate attack, short decay, no sustain, quick release. Another approach would be to take extremely small slices of any sort of sampled material: voices, Foley effects, or audio you grabbed with your iPhone or handheld field recorder. Just make sure the samples are short and percussive.



Name	Date Modified	Size
AM Beep.wav	Today, 7:04 PM	44 KB
Anaconga.wav	Today, 7:03 PM	44 KB
Duotone.wav	Today, 7:04 PM	68 KB
Hi Beep.wav	Today, 7:03 PM	44 KB
Noise Thing.wav	Today, 7:03 PM	44 KB
Triple Noise.wav	Today, 7:04 PM	44 KB

Step 2. Once you have your sounds ready, render each one as a single hit and collect all of these in one folder so you can find them easily.



Step 3. Depending on your DAW, you have a few options. The first is to dedicate each of four to six tracks in your arrange window to a different sound. Alternately, in Ableton Live, you can place each of these sounds on a different Drum Rack "pad" and create a pattern. This same technique works with Ultrabeat in Apple Logic. On an Akai MPC, you can load the sounds onto different pads and work from there.

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Audio examples by Francis Preve.

Step 4. You're ready to sequence. If you've chosen to use multiple tracks in a DAW, create a one-bar loop, and while it cycles, arrange the samples to create a unique rhythm, adding effects on a track-by-track basis. If you're using an Ableton Drum Rack or Akai MPC, it's even easier: Just create a sequence using the samples and leave room for each event to "pop."

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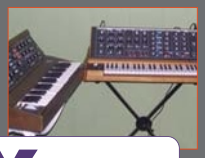


Step by step audio examples.

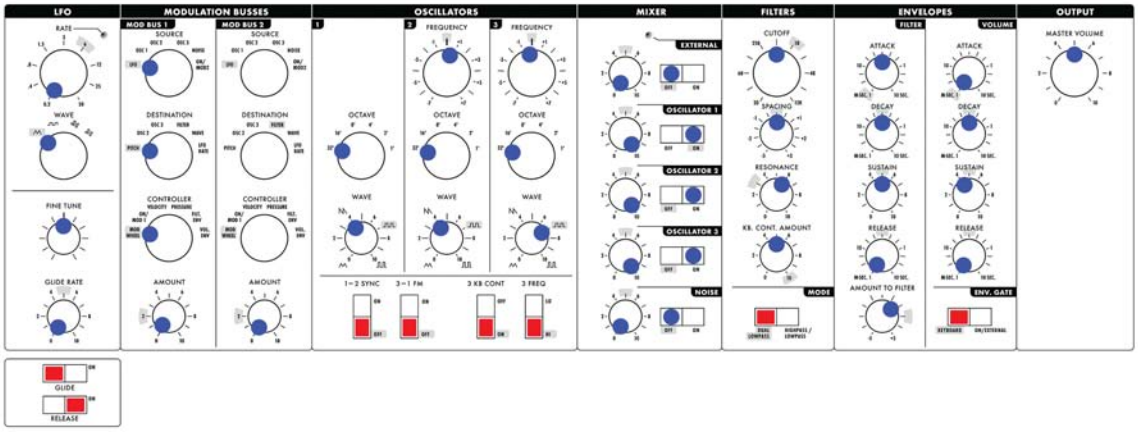
Archive of Steal This Sound audio at the author's site.

Steal This Sound

FIVE LEGENDARY MINIMOOG SOUNDS

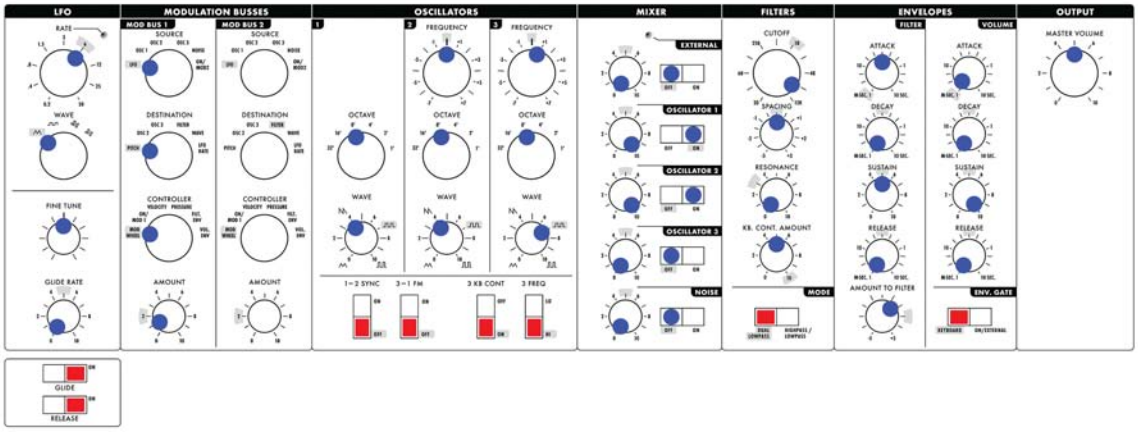
Without a doubt, the Minimoog is *the* classic analog synth, so much that early recordings often attributed any synth simply as "Moog" on album sleeve credits. The progressive rock and jazz-fusion movements pushed the Mini into the spotlight during the '70s. Let's check out some of the Mini patches that made it famous, with patch diagrams from today's Minimoog Voyager Old School. These translate to the "regular" Voyager (though the modulation section is configured somewhat differently), and soft synth imitations equally well.

A couple of general notes: No two analog synths are alike, so if the oscillator tuning, filter settings, or envelope of a patch doesn't sound quite right to you, experiment with very small knob movements. Also, we've left the second modulation bus blank, as it's not critical to any of these patches. You could use it to add more performance control, *e.g.* opening up the filter a bit when you apply aftertouch. Mitchell Sigman



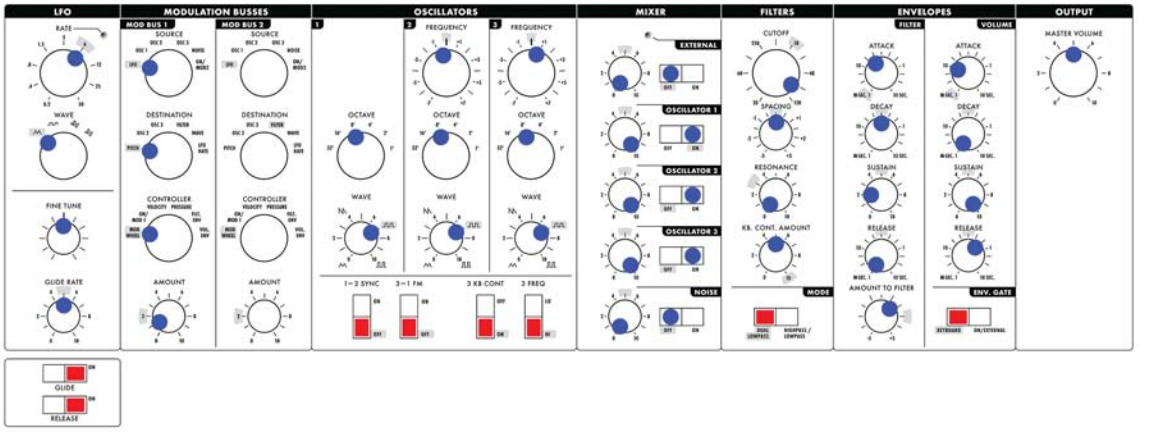
1. Super Funky Bass

Here's the funky, squirty bass patch used in the Bee Gees' "Jive Talkin'" and countless disco classics. We're using all three oscillators with the first two set to sawtooth waves, and the third set to a square wave for thickness. The oscillators are detuned very slightly: +1 cent for oscillator 2, and –1 for oscillator 3. Filter cutoff is 50% open and resonance is about 60% of maximum.



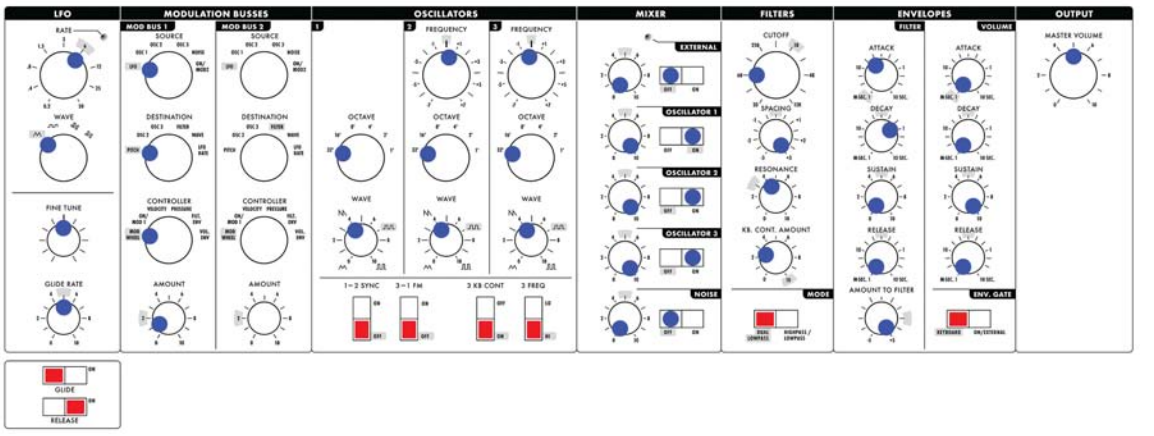
2. Rush's "Tom Sawyer" Lead

One of the most recognizable synth leads ever. The secret to this patch is two sawtooth oscillators just *barely* detuned from each other. You'll need to tweak oscillator 2's fine-tune knob until the oscillators almost sync—check out the online audio examples for reference. Another critical aspect: just a *little* bit of glide, *i.e.* a fast rate. (Clockwise = slower on the Voyager's glide knob.)



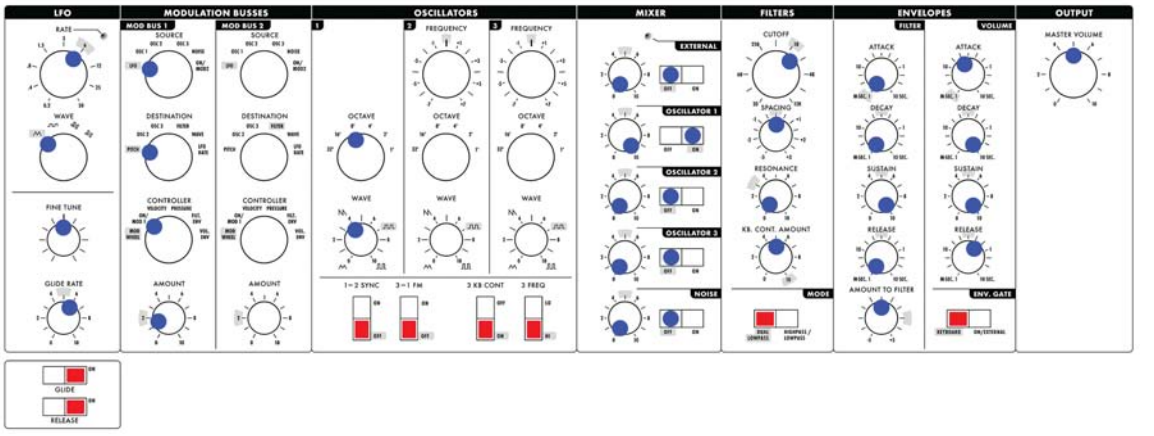
3. ELP's "Lucky Man" Lead

The *other* most recognizable synth lead! Keith Emerson sets all three oscillators to slightly detuned square waves with the filter wide open and a generous amount of glide. Add some reverb for flavor, and go nuts with the octave and resonance knobs at the end.



4. Wakeman Wah

Rick Wakeman really put the classic ladder filter to use in his "Catherine of Aragon" from *The Six Wives of Henry VIII*. Three slightly detuned saw oscillators, a whole lot of filter resonance, and a very slow filter envelope are the keys to this patch.



5. Pseudo-Theremin

As heard in the Portishead track "Humming" from *Roseland NYC Live*, this simple one-oscillator sawtooth patch with heavy vibrato from the LFO, along with a fairly slow glide, evokes '50s sci-fi shows. This patch sounds great with spring reverb emulation or a warm delay, and is way easier to play than a real theremin!

Producers' Roundtable

GO-TO SYNTHS OF EDM

This month, we're kicking off a series of roundtables with today's hottest producers. Each time, we ask a different question to a panel from the electronic dance music or indie-pop worlds. Reach out to us by your favorite means (see page 10) with questions and names of artists you'd like us to interrogate. Francis Preve

WHAT'S YOUR CURRENT GO-TO SYNTH FOR YOUR PRODUCTIONS?

Richard Dinsdale

Richard Dinsdale

At the moment I'm all over the Minimoog Voyager. I was lucky enough to have Micky Slim lend me his, after which I *had* to get one. No matter what I'm making, I can't stop myself from going to the Voyager. It's packed with fat sounds, and with three ocscillators with massive ranges, there's no limit to what it can make.

Josh Gabriel

Josh Gabriel

With all my touring, there's no choice but to have my laptop *be* my studio. My go-to synth is FXpansion Strobe. It generates sound using actual circuit models rather than plain DSP synth modules. The results remind me of the fun I had in the '80s with analog synths. Strobe is warm and alive, a sound not often present in soft synths. The user interface is simple and inviting. They were smart enough to have a basic "init" patch for control freaks like me. What's more, this synth has one of the best modulation systems I've ever seen. I can experiment with modulation possibilities that really push the limits of traditional synthesis.

Josh Harris

Josh Harris

For a while now, my [Access] Virus TI desktop module has been my go-to synth. Although soft synths have come a long way over the last few years, I've always leaned towards hardware. There's a sonic depth my ears don't usually hear in a virtual synth. The Virus TI is extremely deep. The saw wave patches are some of the fattest out there, and the built-in effects add such dimensionality that I do very little to fit sounds into a mix. It also interfaces perfectly with Logic via USB. You can automate it like a plug-in.

Patch Park (Perry O'Neil)

I've been into [Native Instruments] Absynth since I discovered it a few years ago. Its versatility at producing soundscapes is like no other synth. I strongly recommend it for new techno producers, as it's packed with crazy presets. Just a few clicks can turn a rather simple pad into a neat chord stab or a nasty pluck. A feature called Mutator lets you create new sounds based on characteristics of the presets you choose. For me, Absynth is really the flagship of available software synths.

Patch Park

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DIFFERENT PIECES

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Our full review of FXpansion Strobe and DCAM Synth Squad.

Our full review of Native Instruments Absynth 5.

PS60
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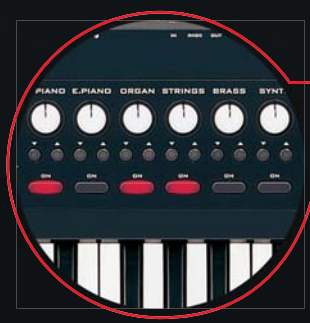
It's our most playable synthesizer ever. No complicated menus or manual diving required. We didn't scale back. We simplified. We didn't remove features. We added knobs. In the end, we designed the PS60 with only one thought in mind: your next gig. So head down to the club, take the stage and leave the menus where they belong – on the table!



Find the right sound fast with 440 in-demand sounds, divided into six popular categories. Turn on more than one to build simple layers or massive stacks.

Why settle for one synth when you can have two? The PS60 can be split instantly at any key, playing different sounds or layers on each half of the keyboard.

Dedicated knobs and buttons make it easy to add, remove, switch, and control the built-in EQ and effects as you play.

*Bonus FREE software runs your PS60 as six "hardware plug-ins" under any recording program!

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KORG

Casio PRIVIA PX-3

by Stephen Fortner

KEYBOARD KEYBUY AWARD

Here's the review: The Privia PX-3 is the most insane value out there in a stage piano right now. Want acoustic and electric piano sounds that stand tall at any gig? Want solid non-piano sounds? Want splits and layers? Want 88 weighted keys that feel a lot more expensive than they are? Want to carry it under one arm almost as easily as you would a four-octave MIDI controller? Want it all for less than the cost of eight first dates at a toney gastropub? Get a PX-3 and be happy. If, however, you think "Casio" connotes keyboards played only by irony-seeking hipsters and actual children, keep reading. You're going to feel like Woody Allen in *Sleeper*.

Standout Sounds

Are the main piano sounds better than they should be? That's the understatement of the year. The dynamic and harmonic transition through the full velocity range is so smooth that if Casio didn't say there were four layers, I might guess eight to ten. "Grand Piano 1" is the full but bright-leaning sound you'd play standing up in a cover band; "Grand Piano 2" is mellower and more suited to jazz and classical.

My favorite electric piano is the effect-less "Elec. Piano Pure," which sounds just like a Mark I Suitcase, from the not-overdone tines to the low-end *brap*. My second favorite is "60's Elec. Piano," which sounds more full-bodied than many ROMpler Wurly presets. In both the acoustic and electric piano banks, a couple of presets add strings or pads so you don't have to use up a layer.

Clavs cover the right bases, from "Superstition" sharp to "Use Me" warm, but "Wah Clav" has a bit too much filter resonance. Though Casio didn't include the virtual drawbars of some other Priviae, organs range from percussive to 16'-and-1' reggae skank to all-bars-out. The rotary effect doesn't compete with dedicated clonewheels, but you can trigger slow/fast speed with an assignable button.

The "Others/GM" bank hides some gems, including Oberheim-like synth brasses and Moog-y saw, square, and pulse leads. The ten drum kits at the end are very punchy. "Synth Set 1" in particular is a credible TR-808 emulation, right down to the cowbell.

Controls and Editing

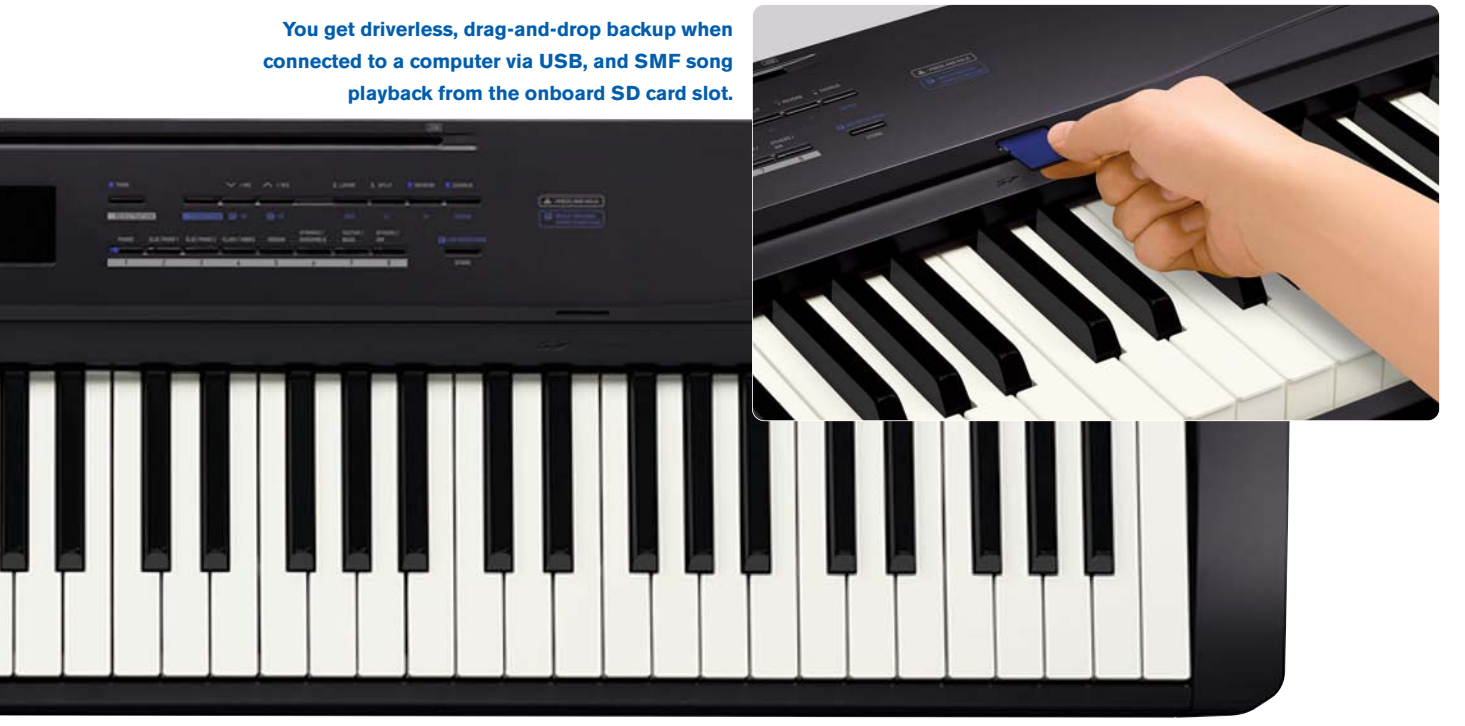
Splitting and layering is pretty easy: Zone Select buttons on the left choose which of four parts the panel affects, while Layer and Split buttons on the right determine what you actually hear. You set the split point by striking a key—nice. The limitation here is that the keyboard does only a two-way split of up to two layers on each side; you can't, for example, reassign an unused left-hand layer as a third right-hand part.

A global EQ with sweepable frequency on each of four bands provides major flexibility for sculpting your tone to the room or P.A. At the per-part level, the PX-3 goes beyond basic mixing and panning to provide some synth-style tweaking: envelope attack and release, filter cutoff (but not resonance), velocity response, portamento time, and LFO-based vibrato. Oddly, there's no monophonic mode, which should be an option for synth leads. That said, the polyphonic portamento is *sweet*.

The Spartan button layout and small LCD keep the price low, but the trade-off is that nearly every button does more than one thing. For some tasks, you press one button while holding another. For others, you hold one down a couple of seconds to engage its alternate function. Overall, this makes for some manual-diving and "How'd I do that last time?" moments, at least at first.

The 64 Registrations make up for this by storing the entire state of the PX-3: sounds, split/layer status, effects, EQ, those synth-like settings,

You get driverless, drag-and-drop backup when connected to a computer via USB, and SMF song playback from the onboard SD card slot.



transposition, you name it. Pre-program some before the gig and you'll be golden. I'd like to see assignable knobs, or at least a data slider instead of just up/down buttons, but again, moving parts add cost and take up space.

In Use

Our PX-3 made rounds between me, composer Richard Leiter, and New Orleans-style piano rocker Josh Charles (see CD review on page 18), to whom I rushed the PX-3 when the club he was gigging at didn't have a piano. After pounding out NoLa stride and boogie all night, Josh offered, "This has to be the best lightweight digital piano out there. The mono piano sound really cuts through the band, too. I'm quite impressed."

Leiter praised the weight: "My fat cat weighs almost as much. It's a little odd putting it on the stand—the PX-3, not the cat—because it's so light. Once you start playing, though, it feels as solid and responsive as any 75-pound keyboard."

All who tried the PX-3 raved about the feel. Though it has plenty of weight for serious piano practice, there's a fluid, non-fatiguing quality that made Josh say, "Usually, my hands hurt after playing a digital piano all night, because I'm digging in too hard, trying to draw out something that's not there. Not this time." I agreed completely. The black keys do have a bit of side-to-side movement, but this was never an issue in actual use.

Conclusions

Doctor Who's TARDIS is famously bigger inside than out. Casio seems to have employed similar sci-fi technology to put such a serious piano action in an instrument that weighs next to nothing. The least expensive step up in features and sound would be something like a Yamaha CP50, at literally twice the street price and weight. That illustrates the ground the PX-3 stakes out: It's damned good—more than enough for most real-world gig use—and to get any better, you're looking at *multiples* of price. That's the kind of value we call a Key Buy. k

Specifications

PROS Smooth, detailed, playable piano sounds. Great EP and synth sounds. Impossibly light given the great-feeling weighted action. Supports half-pedaling with optional three-pedal unit.

CONS Editing is fiddly using the buttons and small LCD. No aftertouch. No sweep pedal input, just two footswitch inputs.

CONCEPT Ultralight stage piano with split/layer ability.
POLYPHONY 128 voices.
ACTION Fully weighted and graded.
KEYBOARD ZONES Upper 1 and 2, Lower 1 and 2.
EFFECTS Global chorus and reverb plus a DSP multi-effect sharable by two zones/parts.
W x D x H 52.04" x 11.25" x 5.31".
WEIGHT 23.8 lbs.

PRICE
List: $999.99
Approx. street: $800

priviapiano.com

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Video: Privia PX-3 unboxing and first play.

Casio's Mike Martin demos the PX-3 at retailer Kraft Music.

Korg PS60

by Ken Hughes

The look of Korg's new PS60 is all business, not unlike their earlier M- and T-series keyboards or a Roland D-50. While Korg's designs for the Radias, M3, and SV-1 are certainly more audacious, the PS60's no-nonsense appearance bespeaks its single-minded mission: To be taken onstage and played live. You have to wonder if the lack of flamboyance is calculated to enhance appeal in hard times: "Look, honey, it's not a flashy toy. Can I get one, please, can I, please?" The lightweight plastic enclosure is reasonably rigid, and the panel is as organized and as easy to read on a dark stage as it is in bright sunlight. (The LCD doesn't fare as well in the sun, but what LCD does?) It's also appealingly compact.

Layout

Performance controls are at left and include a dedicated button for simu-Leslie speed on organ sounds, octave and semitone transpose controls, and four banks of five preset Performances per bank. A Performance is a macro-level setup encompassing sounds, splits and layers, effects sends, modulation effects, delay, reverb, and EQ. The Easy Setup panel at center is where you choose sounds and build splits and layers on the fly.

Here's where things get interesting. The PS60 is always in what many other axes call multi, combi, or performance mode. All six sound categories are available at the touch of a button. Want an acoustic/electric piano layer? Light the On button under "A. Piano" and choose a piano sound, hold that On button and press its counterpart under "E. Piano," then choose an electric piano. Balance to taste using the white volume knobs. Done. Dare to create a massive, six-layer monstrosity? Light up all six On buttons and go nuts. With 120-voice polyphony, you're pretty much ready for anything.

Keyboard Feel

When I placed the PS60 front and center in my studio, and before turn-

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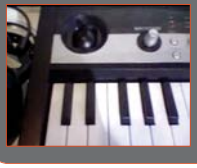

Video: First look at Korg's other new keyboard, the MicroStation.

Audio demo by the author.

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ing it on, I thought its synth-action keys were way too light and that they bottomed out too softly. Why do I mention this? Because you might make the same judgment if you encounter the PS60 at a retailer where they don't keep every unit plugged in. After I spent some time *playing* (what a concept!), a whole new impression confronted me. The PS60 impressed me as much with its keys-to-sound connection as the vastly more expensive Yamaha CP1 stage piano. Granted, it's a completely different feel from anybody's piano-weighted keys, but the PS60's keys are a pleasure to play because—and this is important—their response is so tightly integrated with the internal synth engine. Many of the source samples, if they don't actually feature a dozen or so velocity layers, *feel* as if they do. It's so bloody easy to be musical. Okay, I'm gushing. Go play one and find out why.

Sounds

Certainly we're in bread-and-butter land—but it's artisan bread and fresh butter from a local creamery. The grand pianos in particular are gorgeous, with plenty of girth, sparkle, and air. They're everything you want in a stage piano, and there are several tasty flavors. It's here that the finger-to-music connection is at its absolute best. If you buy and connect a Korg DS1H damper pedal (about $60), you get half-pedaling, too. Stretch-tuned pianos are offered; try them for solo piano songs or passages.

Electric pianos, both Rhodes and Wurly, are every bit as good, aided by a clever implementation of the Lock button above the joystick: Push the stick forward for tremolo to taste, then press Lock to keep it there. (Incidentally, the Lock button can affect either, but not both, of the joystick's axes.) Creamy, swirly, snarly, Disney end credits—all the essentials are on hand, as well as cool extras like digital, Prophet VS-style electric piano sounds, which are rendered really well. Clavs and harpsichords live in this bank, too, including one with the key-off noise of a real Clavinet with sticky old hammers.

Korg has great organ simulations, but CX3-style drawbar modeling isn't part of the PS60's innards. The simu-Leslie isn't as convincing as I'd like to hear, but Korg has included a slew of drawbar tonalities, plus delightfully cheezoid transistor organs for when you need to pump it up, light someone's fire, or cry 96 tears. If you spend most of your time playing B-3 sounds, you're probably going to get them from a dedicated clonewheel anyway. All this said, the audio demo at keyboardmag.com attests that even a relative hack like me can wring a decent Hammond sound out of the PS60.

In Use

Spending a few weeks with the PS60 was really enjoyable. I used it in the studio as both MIDI controller and sound source. The keys that I had initially dismissed became my new favorite for playing soft synths, devices in Propellerhead Reason, and the like.

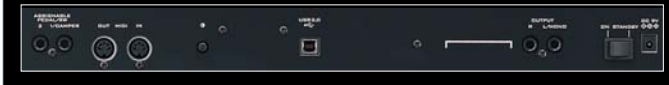
I cooked up a demo tune that answered the question: "What would it sound like if Tower of Power had Donald Fagen and Bernie Worrell sit in?" Since the PS60 contains no drum sounds, not even in a General MIDI bank buried somewhere, Reason provided drums and percussion. Since the PS60 isn't a workstation with a built-in sequencer, I recorded everything else live as audio into Pro Tools LE 7.4. I found a perfect bass guitar among many worthy candidates in the Synth bank, which seems to be more or less the "everything else" category in the PS60.

Layering a Dyno Rhodes with a bright grand piano was a snap, and with a little tweak to the phaser effect on the Rhodes, I had exactly the

Specifications

PROS Exceptional finger-to-music connection. Half-pedaling on piano sounds with extra-cost pedal. Compact and light. Great sounds. Multiple tuning temperaments.

CONS No aftertouch. No arpeggiator. Can't layer programs from the same category.



CONCEPT An always-in-multi-mode gig synth loaded with high-quality sounds you can split and layer with alarming speed.
POLYPHONY 120 voices in single mode; 60 voices in double mode.
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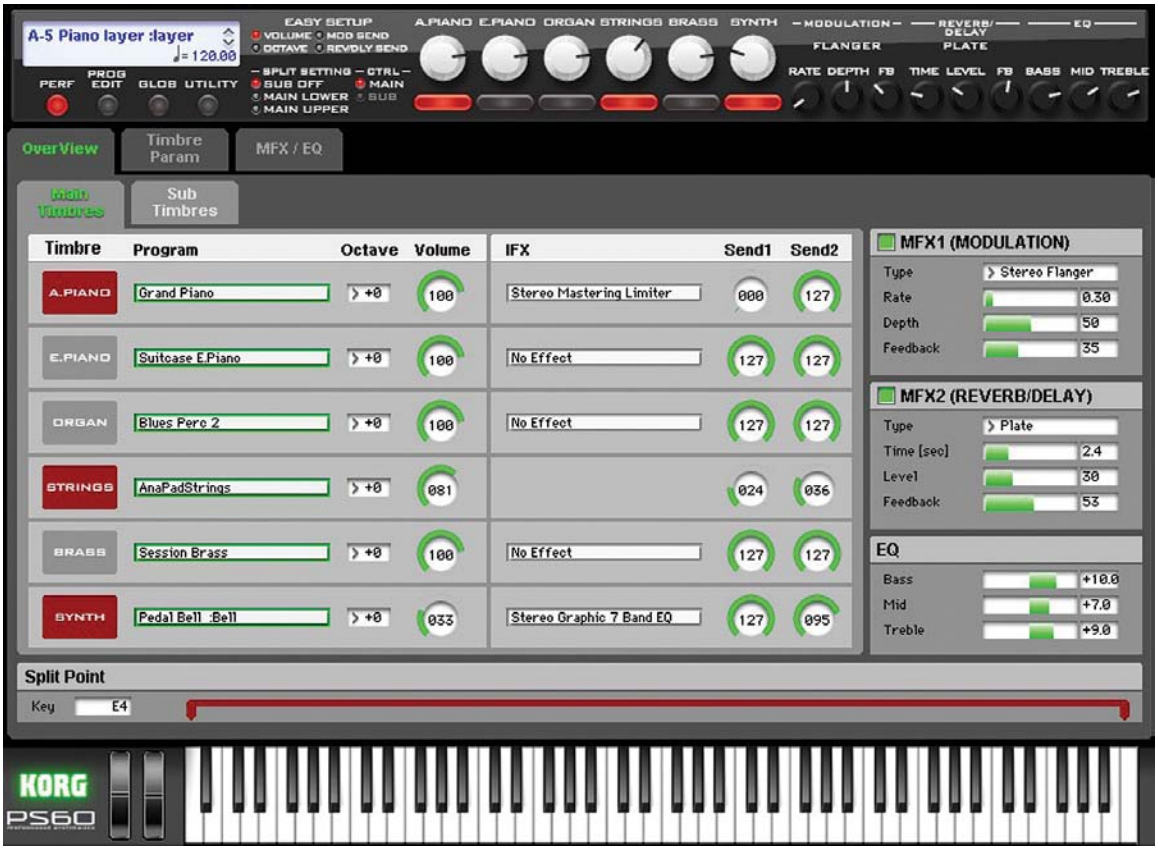

With the PS60 connected via USB and this plug-in or standalone editor running on your Mac or PC, knob and button moves on the PS60 update instantly onscreen, and vice versa. You can also automate the PS60 like a soft synth.

right texture. I tracked the layered piano-and-Rhodes in one pass. Building a credible funk horn section required two passes with different sounds; the PS60's otherwise excellent "TOP Section" patch gave me a pre-made split (this is a single program, not a multi) with a fat baritone sax in the left hand and a sax-and-trumpet trio in the right. It sounded a little soft, though, so I overdubbed a pass of "Killer Brass," which skews more into Jerry Hey territory. Mixed just under "TOP Section," it added extra sharpness. I also used the pitch bender to add very subtle "falls" to the end of each brass stab on this pass. Korg's joystick has always made this gesture easier for me than a pitch wheel or Roland-style paddle. If the PS60 let me layer Programs from the same category, I could have recorded both brass sounds in one pass, but no dice.

After that, I tracked the organ, with some judicious volume pedal work using the pedal from my Korg CX3. I used the "Distortion" patch, which did a nice job of evoking Chester Thompson's "Squib Cakes" and "What Is Hip?" tones. For the lead synth sounds, I had so much fun blowing through them that I can't tell you exactly which ones I used, but I can tell you there's nary a ho-hum sound in the lot. Hiding in the Synth section are a number of pretty good guitars as well, including a distorted lead and a jangly, tremolo-dipped Telecaster.

Not only is there a great software editor included with the PS60, but it also runs as a plug-in in all major DAWs, as well as standalone. It makes working with the PS60 like working with a soft synth, right down to automating all front-panel parameters from your DAW. (In Pro Tools, you need to add those you wish to automate in a pop-up after clicking the Auto button in the plug-in itself.)

The PS60's editor wants to be connected to the PS60 by USB only; I tried it with old-fashioned MIDI and USB at the same time because my rig includes hardware synths connected via a vintage Midiman interface, and I got a MIDI note loop that ate up the PS60's polyphony and gave me phasey sound no matter what the local on/off settings were on each end. The fix was to go into Pro Tools' "Input MIDI Device" settings and de-select the Midiman port to which the PS60 was connected, so that Pro Tools saw the PS60 over USB only. Not the PS60's fault—just something to look out for if your studio is "blended" like mine.

Conclusions

As I put a rig together for a tour with my band Maybe Tuesday, the PS60 is very attractive with its light weight, small size, low cost, fantastically responsive keys-to-synth connection, and quick navigation. Using the editor software beforehand and storing custom presets will save time. I've seen some online forum chatter bemoaning the lack of a sequencer. That misses the point—if you want a workstation, go get one. An arpeggiator would've been useful, though. Though the absence of aftertouch detracts from the appeal as a player's axe, you can't have everything at this modest price.

The needs of weekend warriors in bar bands and in churches are remarkably similar, and the PS60 is a home run for both camps, especially those on a tight budget, and isn't that most of us right now? I predict that a lot of mid-level touring pros, not just beginners, will get a PS60, a case, and a spare wall wart, and hit the road. I'll likely do just that. k

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Moog Music TAURUS 3

by David C. Lovelace

One of my best musical memories is the first time I heard a Moog Taurus in the early '80s. Geddy Lee of Rush masterfully employed this foot-powered tank on the screen of my friend's black-and-white TV while simultaneously playing a mountain of synths and a double-necked Rickenbacker. It was a magical, archaic, unobtainable instrument perhaps only meant for this special breed of one-man-band warlock. Still, it looked just like the pedals on Mom's old Lowrey organ, so I thought to myself, "Maybe someday."

The majestic bows and wows of the Taurus were expertly programmed by Dave Luce of Polymoog fame, and etched permanently on many minds as the definitive synth bass tone. Tone-questers have been driving up prices of used analog gear steadily, including the original Taurus, owing to that old notion that there's no way to put the "wow" in our bow-wow other than to spend ungodly cash on the clunky greatness of ancestral technology. That may have been true once, but thankfully, it no longer is. After years of pleading by Moog fans, the company has released the Taurus 3, a glittering, wood-capped, aluminum marvel that culls design cues from their oldest to their newest synths.

Overview

The Taurus 3, like the first Taurus, is a one-octave pedalboard attached to a throaty two-oscillator analog synth. Though the Taurus 3's oscillators generate sawtooth waves only, it adds a far more programmable interface than the original, not to mention patch memory for 52 presets. The two big sliders from the original Taurus give way to oversized, rubberized, light-up footwheels: Volume, and a Control wheel assignable to

The Taurus 3 is more like the original (right) than the Taurus II (left), which was essentially a Moog Rogue on a stick, albeit with a longer 18-note pedalboard.

Specifications

PROS Recaptures the huge sound of the original Taurus. Great updates, including arpeggiator. Fluid performance ergonomics. Missile-proof construction.

CONS Oscillators generate sawtooth waves only. Three-octave maximum MIDI input.

CONCEPT Foot-controlled analog bass synthesizer.
OSCILLATORS 2.
FILTER 24dB-per-octave lowpass, ladder 20Hz–20kHz range.
MODIFIERS Latch arpeggiator, volume and filter envelopes, LFO.
PRESETS 52; 1 bank of 4 factory presets each, 12 banks of 4 user presets each.
W X D X H 25" x 24" x 8.5".
WEIGHT 45 lbs.

PRICE: $1,995 (no list/street difference).

moogmusic.com

anything you'd want to tweak.

The design is so evocative of the Little Phatty that you could call the Taurus 3 a "Big Phatty." Connections, which are all on the left end block, include hi-Z and lo-Z mono audio outs (for plugging into a bass amp or mixer, respectively), plus control voltage (CV) inputs for volume, filter, pitch, and keyboard gating, enabling modular synth-like patching with your other analog gear. The top area of the panel contains the Phatty-like buttons, which control oscillator, LFO, filter, and arpeggiator parameters. The bottom half of the panel has nine stompbox-style buttons for patch and bank select, transpose, and various performance controllers. Though the panel says "Control" under the three rightmost buttons (Glide, Decay, and Octave), those aren't assignment buttons for the Control wheel—they're separate on/off toggles. As a rule, the Control wheel affects the most recently selected parameter in the top area—and the adjacent vertical LED bar is both quick reference and cool eye candy.

Performance

At a public performance of electronic music, the only problems I had were solely on my own foot—pardon the pun. Despite never quite mastering the pedals like Geddy Lee did, I had an easy time changing patches, sweeping parameters with the Control wheel, and setting tap tempo, an alternate function of the Transpose button when in Program mode. You should practice on these pedals as you would on any unfamiliar instrument before performing. The technique associated with the original had more to do with root-and-fifth rock foundations than with Hammond-style fancy footwork, so it's not inordinately difficult to become competent. Else, hook up a MIDI controller and play this beast with your fingers.

On the subject of MIDI control, the Taurus 3 receives note-ons for *C0* through *C3* only. This is a MIDI limit only, meaning you can get higher by controlling pitch via analog CV. Depending on your MIDI keyboard, you may need to downshift an octave or two to get to *C0*, the low *C* of the pedalboard itself. Then you'll have the full three-octave range—four if you stomp the Octave button at the right time. Still, given the many presets that sound like they'd make great leads, I'd like to see a higher MIDI note range for finger-dependent shredders.

Sounds

While the Taurus 3 may not double as a lead synth, it makes up for this in spades with its collection of preset patches. Right out of the box, you're in business with A1, "Taurus III," a low growl that opens up wonderfully with the Control wheel, here assigned to cutoff amount. Possibly my favorite preset is B2, "Gordon." It's a perfect resonant sweep I used quite a bit as a one-note accompaniment that rounded out many a performance with its pure synthetic bliss. Presets E4, "SlowRezzRamp," and G2, "BullAcidTest," are two great choices for definitively acidic Roland TB-303-style arpeggiations. You might even give Geddy himself a run for his money with G3, "Muted Arp," which sounds like it was lifted directly from one of Rush's 1980 *Signals* tracks. If you play prog, fusion, or any kind of electronica, you'll be very happy with the sounds the Taurus 3 will add.

Conclusions

Sure-footed bass pedal-ists and analog fans in general are sure to love the return of Moog's big, bad, bass beast. It's a stylish, well-built synth with an analog soul that purists and traditionalists will instantly recognize and fall in love with all over again. It sounds as great as it looks. More importantly, it sounds as great as its ancestor. k

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Video demo by the author.

More Taurus 3 audio examples.

Two new modules beef up Reason 5. Kong is a percussion designer with a choice of synthesis types. Dr. Octo Rex loads eight REX file beats at once and lets you switch between them on the fly.

Propellerhead

REASON 5 / RECORD 1.5 DUO

by Jim Aikin

In a world overflowing with great music software, some key factors set Reason apart. First, Propellerhead has always paid close attention to user interface design. As complex as Reason is by now, it's remarkably easy to use. Second, the Propellerhead gurus have always had a clear vision of what Reason is and what it's not.

Though the combination of Reason and Record is a complete audio and sequencing-based multitrack production studio with its own great instruments and effects, it's not a do-everything digital audio workstation in the mold of Logic, Cubase, Sonar, and Digital Performer. This leads to certain limitations. Notably, Reason doesn't host third-party plug-ins. Nor is there a video window, so it's not suitable for soundtrack work. One advantage of this sort of closed system is that it's extremely stable. While working on this review, I encountered not a single glitch of any kind. Also, the user interface is consistent no matter what module you're using.

Discussing even the basic features of Reason would take many pages. It has terrific synths (Thor, Malström, and Subtractor), a full-featured multi-sampler, a ten-channel drum sampler, a monophonic step sequencer, detailed control over the feel of rhythm tracks, a variety of great-sounding effects, and a rear-panel patching system where dragging virtual cables between virtual jacks turns the whole thing into one vast modular instrument.

Prior to Record 1.0 (reviewed Dec. '09), you had to use ReWire to pipe Reason's audio output into a DAW if you wanted to record audio

tracks. Record changed all that. Record is available separately, but if you own Reason, the two become a unified program. All of Reason's instruments are available for adding MIDI tracks to Record, all your tracks appear in one sequencer display, and Record's powerhouse mixer is available as an output for Reason instruments.

In this review, we'll focus on two things. First, the new features in Reason 5: the Kong percussion designer, Dr. Octo Rex drum loop player, a new sequencer mode, and integrated sampling. Then we'll take a look at Record 1.5, which adds the much-needed Neptune pitch corrector/voice synth to the lineup.

Kong

Reason's ReDrum module is very capable, but by now it's looking a little old-school. ReDrum is still part of Reason, but Kong kicks Reason's percussion into a whole new dimension. Kong lacks ReDrum's pattern sequencing, but this is not a problem. First, many people record ReDrum parts directly into Reason's sequencer, and seldom use the pattern editing features. Second, if you prefer patterns you can easily set up a pair of ReDrums and use their patterns to play Kong, by connecting ReDrum's rear-panel gate outputs to Kong's gate inputs.

Kong has 16 pads and a vaguely MPC-like look. You can record from the pads into the sequencer by clicking them, which is a nice extra, or play them from a MIDI controller in the normal way. They even respond to mouse position by varying the velocity, which many mouse-click pads don't do.

Kong is a bit like Thor in that you can choose different modules for its sections. Each pad can produce sounds using sample playback, a triggered REX file loop, physical modeling, or modeled analog synthesis. The latter two are brand new to Reason, and they add a huge palette of sounds to Kong.

Speaking of sounds, Kong comes with dozens of high-quality kits, some of them designed by such luminaries as Printz Board and Bomb Squad. And naturally, you can mix and match hits from different kits. Each pad has two insert effects, and some of them are unusual: a noise source, a tone source, a snare rattle generator, and a transient shaper. Rounding out the list are compressor, filter, parametric EQ, reverb, tape echo, ring modulator, and an overdrive/resonator. After the insert effects, the drum sounds can then be routed to a dry output, or to either of two more "global to Kong" effect modules. On the rear panel there are inserts (stereo) between the two global effect modules, so you can patch any of Reason's devices into the signal path.

I would've liked to see rear-panel "CV" inputs to the individual drum modules, but that would've made the rear panel a mess. Also, some of Kong's knobs can be automated and some can't. On the physically modeled bass drum, for instance, Pitch, Damp, Decay, and Level can be automated, but Beater Level, Tone, Density, Tune 1, Tune 2, and Bend Amount can't. In the NN-Nano sampler, Pitch, Sample Start, Level, and Decay can be automated, but not Amplitude Attack Time, Pitch Envelope Amount or Time, or any of the five Velocity Response knobs. Depending on what you want to automate, this may or may not become a source of frustration.

Describing every feature of Kong would take pages. Briefly, the sample playback module lets you stack and assign velocity zones to multiple samples. There are three physical models (kick, snare, and tom) and four analog models (the same three plus hi-hat). If you're into designing drum sounds, you're gonna love Kong.

Dr. Octo Rex

The Dr. Rex loop player has been around since Reason 1.0. In Reason 5, Dr. Octo Rex replaces it. According to Propellerhead, existing songs that use Dr. Rex should work fine, as Dr. Octo Rex will load the old Dr. Rex data into its first slot and play it back.

Dr. Octo Rex loads eight REX files at once. All eight share the same basic set of voicing controls (filter, two ADSR envelopes, and so on), but four new parameters have been added for each slice of each loop: filter frequency, reverse, output, and alt group. There are four stereo output

Specifications

PROS Powerhouse percussion synthesis. Integrated sampling. Convenient song arrangement tools. Great user interface. Extensive rear-panel patching. 2GB sound library. ReWire support.

CONS Sample editing could be beefed up. Still doesn't host third-party plug-ins. No video window.

CONCEPT *Reason:* A do-everything rack of synths and effects with a very capable sequencer. *Record:* Audio multitracking and modeled-analog mixing console. *Duo:* Record and Reason devices integrated as a do-it-all virtual studio.
REASON INSTRUMENTS Subtractor modeled analog synth, Malström granular synth, Thor modular synth, NN-19 and NN-XT samplers, ReDrum and Kong percussion, Dr. Octo Rex loop player.
REASON EFFECTS Reverb, delay, chorus/flanger, phaser, Scream distortion, vocoder, envelope filter, mastering (equalizer, stereo imager, compressor, maximizer).
RECORD INSTRUMENTS AND EFFECTS ID8 sample player, Neptune pitch correction, vintage-emulation EQ and dynamics on every mixer channel, master bus compressor, plus most of the Reason effects.

PRICE

Record/Reason duo
List: $449.99 **Approx. street:** $400

Reason 5
List: $349.99 **Approx. street:** $300

Record 1.5
List: $299.99 **Approx. street:** $250; $149 for Reason owners

propellerheads.se

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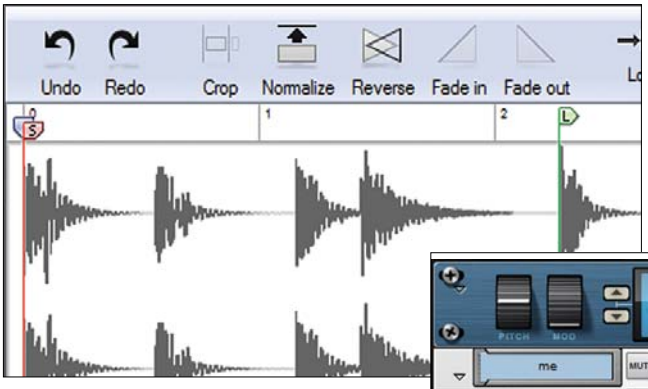
Author's audio demo of Neptune pitch correction.

Our original review of Record version 1.0.

record U

Tutorials by former *Keyboard* editor-in-chief Ernie Rideout.



After capturing a sample in Reason, you can edit it in the Edit Sample window. The tools here are basic: normalize, fade-in/out, reverse, crop, and loop point editing.

The modules in Record include the ID8 synth and the audio track device, which can host inserts. Here, the Neptune Pitch Adjuster is inserted in an audio track.

pairs in addition to the main output. This means that you could route a snare, for example, out to a reverb.

You can trigger separate loops in Dr. Octo Rex using MIDI keys in the octave below a 61-note keyboard's five-octave range—shift your keyboard down an octave to get there. In this performance mode, only one loop will play at a time. The new loop that you've triggered can start on the next bar, the next beat, or the next sixteenth-note—but the operative word is "start." Dr. Octo doesn't keep track of where you are in relation to bar lines, so it can't switch to a different loop in the middle of the current loop. If you trigger a loop on beat 3 of a bar, for example, it will be offset by half a bar.

When you use the Copy Loop to Track button, each loop will have its own lane within the sequencer track, and the selection of which Dr. Octo slot the notes will be sent to is controlled by automation. This is quite useful, as you can easily copy one loop to the track, then have its note data play different REX file slices.

When two or more slices of a loop are all assigned to the same alt group, Dr. Octo will choose among them randomly if it's playing back a loop using its internal sequencer. When you click the Copy Loop to Track button, each iteration of the beat loop within the longer loop region in the sequencer track will have its own randomized pattern of note events for each alt group, but from then on the pattern will be repeatable, and you can edit it as needed. One way you'd use this feature is for randomly choosing which of four snare hits will fire on beats 2 and 4.

Blocks

Although Reason has a couple of pattern-based devices (ReDrum and Matrix), its main sequencer has always been linear, playing your song from start to finish. Blocks change all that. The song still plays as it did before, but you can now record up to 32 multitrack Blocks and insert them wherever you like in the song. A Block could be a multi-instrument drum groove, for instance, or an entire verse. Laying out verse/chorus forms with Blocks is easy.

Thirty-two Blocks may not seem like a lot, but the clever thing is that you can override the data in any Block at any spot. If you want a different drum fill at the end of the second verse, for instance, just go into record mode and overdub it. Your new recording will replace the data in the Block—but only at that one spot. In addition, any track or lane can be muted during the playback of any Block, so you can build an intro one layer at a time using only a single block, by unmuting a new track every two or four bars.

Sampling

New in Reason (Record is not required for this) is the ability to capture new samples. These can be automatically assigned to sample playback devices, such as a ReDrum or Kong channel. You can sample external audio, or capture the sound coming from one or more Reason devices. You can then export samples if desired—say, if you've designed a killer drum sound in Kong and want to use it in another program.

A maximum of 30 seconds of stereo sampling time (per sample) is available. This will be plenty for sound design or for capturing loops, but not enough to record a whole song.

In the basic Sample Edit window (see above), you can normalize the gain of an entire sample or any part of it, but user-definable gain change is not implemented, so there's no way to squash unwanted clicks or pops. Likewise, you can program a fade-in or fade-out for the sample, but user-definable fade curves aren't possible.

Record 1.5

By itself, Reason is strictly for making music with its own suite of instruments. You can import samples recorded elsewhere and play them using

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a Reason sampler module, but that's hardly a convenient way to record audio for, say, adding a vocal track.

Record is for audio multitracking. Even without Reason, Record has most of the Reason effects, but only one basic MIDI instrument, called ID8. Record has a massive, feature-rich mixer, and also a guitar amp modeler. You can record multiple takes in loop mode and comp together a keeper track without trouble. ID8 gives you a simple but useful selection of keyboard, bass, and drum sounds in case you don't have Reason and want to support your guitar or vocal tracks.

Since version 1.0, Record could time-stretch audio tracks—very convenient for changing the tempo of a vocal for a dance remix. In 1.5, you can also adjust the *pitch* of audio, thanks to Neptune (see below).

Unlike most DAWs, Record saves all of its audio data in the song file itself. This has advantages and drawbacks. A plus is that it aids collaboration: Send someone your project, and they won't be asked to "please locate" audio files. On the other hand, if you save incremental versions of a song as you're developing it, Record will chew up hard drive space pretty quickly. Also, if you want to open an audio track in another program, you'll go through an extra exporting step first.

Neptune

Like other retuning systems, Neptune is designed mainly for monophonic tracks such as vocals. Neptune has a number of features beyond simple pitch correction. I found that it worked well for both subtle pitch correction and T-Pain-style vocal mangling.

Neptune processes audio while the music plays—it's not an editor. Its most important controls are the Correction Speed and Preserve Expression knobs. As you turn up the Correction Speed, the vocal will "snap" to the correct pitches more quickly. The Preserve Expression knob lets vibrato and pitch slides sneak through without being squashed.

In the center of the panel are controls for setting a scale whose pitches will be used in the correction process, and a Catch Zone Size slider: When an incoming pitch is in the "catch zone," Neptune will correct it.

There are four programmable presets for the scale controls, and the preset select buttons can be automated. This is nice if your song changes key in the middle, for instance. Correction Speed and Preserve Expression settings aren't stored with the presets, but these knobs can be automated separately, which is even better.

If you send Neptune MIDI notes, it "corrects" the pitch of the vocal to whatever note you play. This lets you superimpose an entirely new melody on a vocal. Instead of (or in addition to) correcting the pitch, you can use Neptune as a transposer; its range is plus or minus 12 semitones, and there's a Cents parameter for fine-tuning. With the Formant Correction knob, you can move the vocal formants up or down independent of the pitch, to help the transposition sound more realistic, or intentionally less so for chipmunk or Darth Vader vocal effects.

Neptune also includes what appears at first glance to be a bare-bones vocoder. Reason has a real vocoder, of course, but the Voice Synth in Neptune, while not actually a synthesizer, is easy to use, and it's in Record if you don't have Reason. When you route MIDI notes to it, the Voice Synth pitch-shifts the input up and/or down simultaneously to all of the MIDI notes it receives, producing what sound like vocoded chords. The Voice Synth can be routed to a separate rear-panel audio output, which I recommend. I added an ethereal choir behind my lead vocal by processing the Voice Synth output through a filter, a chorus/flanger, and a reverb, then mixing it in at a fairly low level.

Conclusions

Reason 5 and Record 1.5 are welcome upgrades—and Record 1.5 is free if you use Record 1.0 standalone. The new features are very welcome, especially the Kong percussion designer and the Blocks mode in the sequencer. Neptune is not groundbreaking, but it fills a hole in the feature set, making Record much more competitive. I doubt I'll use the live sampling much, but for some musicians it will be a great plus. For creating almost any kind of pop music on your computer, the Reason/Record Duo is a terrific choice as a creative platform, especially considering that it sells for less than the price of most DAWs and many single plug-ins.

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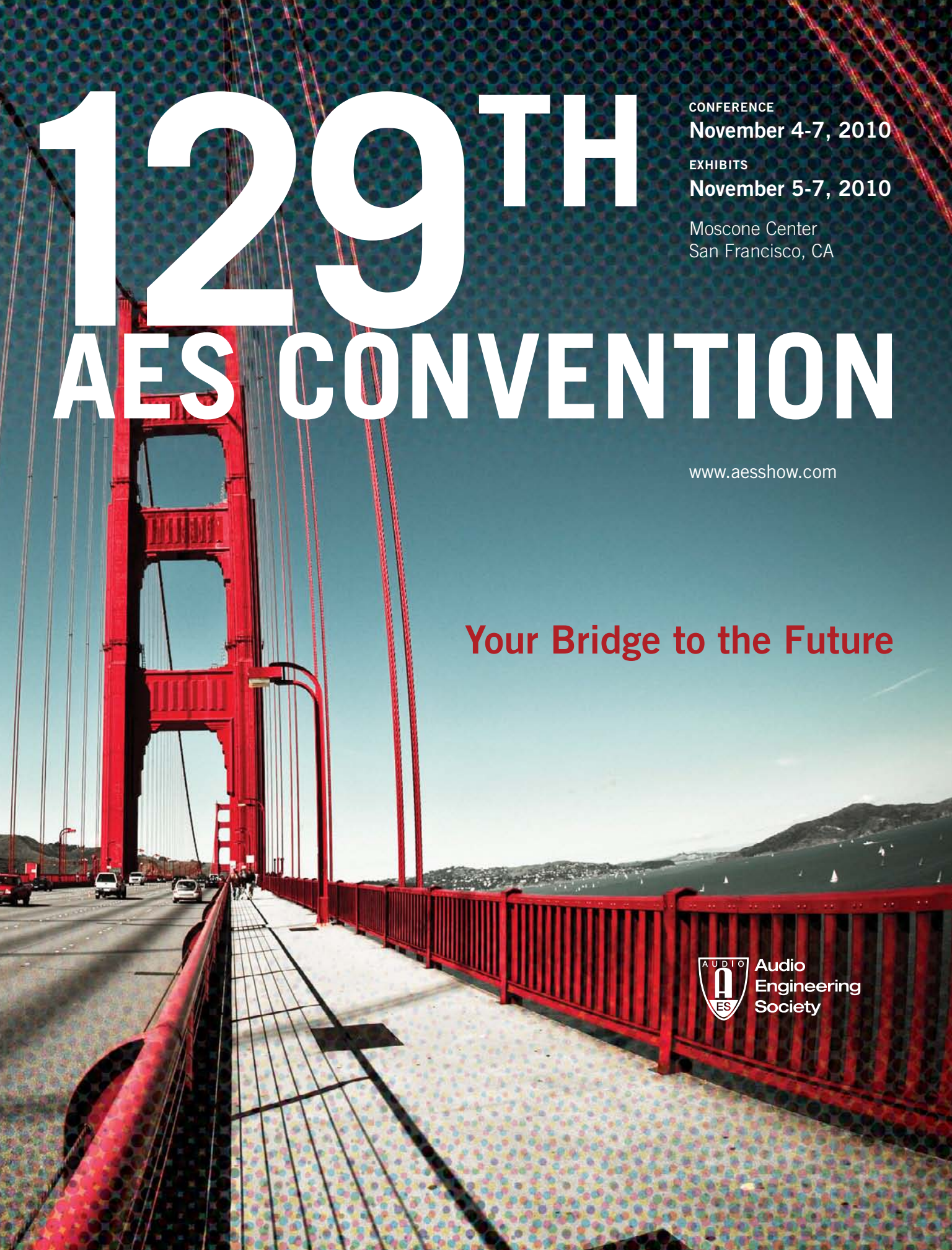
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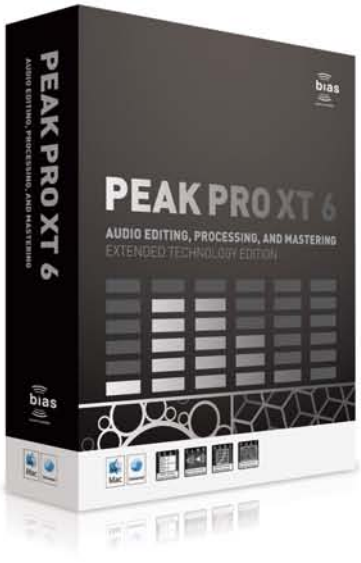

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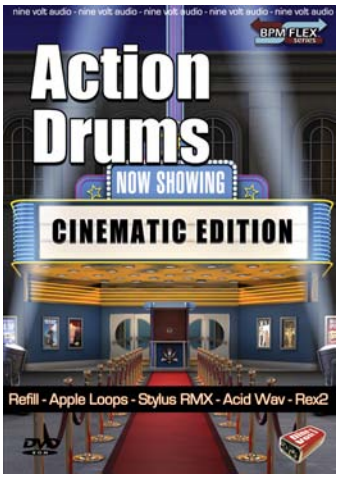

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BEYOND AND BECAUSE OF THE MINIMOOG

by Erik Norlander and Stephen Fortner

In honor of the Minimoog's 40th birthday, we look back at synths that shared similar design aspects, or whose makers got into the solo synth game after the market proved that Bob Moog was onto something.

1969

EMS VCS3

Predating the Minimoog by a year, the VCS3 also subscribed to the wisdom that three oscillators are better than two. A pin matrix straight out of "Battleship" let you change the default signal path.

1972

ARP ODYSSEY

The most popular Mini alternative made up for one less oscillator with two-voice polyphony, plus highpass *and* lowpass filters. The Mk. II used a Mini-like 24dB-per-octave filter, which caused a row between ARP and Moog at the time.

1972

EML ELECTROCOMP 101

This Connecticut company's semi-modular synth packed *four* oscillators and a 12dB-per-octave multimode filter into a suitcase.

1993

WALDORF WAVE

The pricey heir to the PPG throne pumped digital wavetables through analog filters. Its Minimoog-like flip-up panel was designed by Axel Hartmann, who would later design the Moog Voyager's panel.

1984

MUROM AELITA

This rare Soviet synth takes notable Minimoog-inspired cues: three oscillators, a 24dB-per-octave lowpass filter, and a flip-up control panel. It's also built like a cold war tank.

1981

SEQUENTIAL CIRCUITS PRO-ONE

Based on the Prophet-5 design, this low-cost solo synth added something neither the Prophet nor the Minimoog had: an onboard arpeggiator and sequencer.

1978

KORG MS SERIES

Clockwise from lower right: The dual-oscillator MS-20, single-oscillator MS-10, SQ-10 sequencer, and MS-50 expander formed Korg's family of patchable monosynths.

2000

STUDIO ELECTRONICS SE-1

The first true Mini clone in a MIDI-playable rackmount. The company's earlier MIDI-mini, by contrast, repackaged actual Minimoog D circuit boards.

2006

KORG RADIAS

Descended from Korg's flagship OASYS, the virtual analog Radias (shown) and recent M3 workstation shout out to the Mini with their retro flip-up panel designs.

2010

HELMTRONIC CHALLENGER

Shown at this year's Frankfurt Musikmesse, this aptly-named German boutique synth boasts four oscillators, two filters, and of course, a flip-up control panel.

PHOTO THANKS

Pro-One: Dave Smith.
Aelita: mechanical.animals and matrixsynth.com.
Challenger: Hans-Joachim Helmstedt.

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